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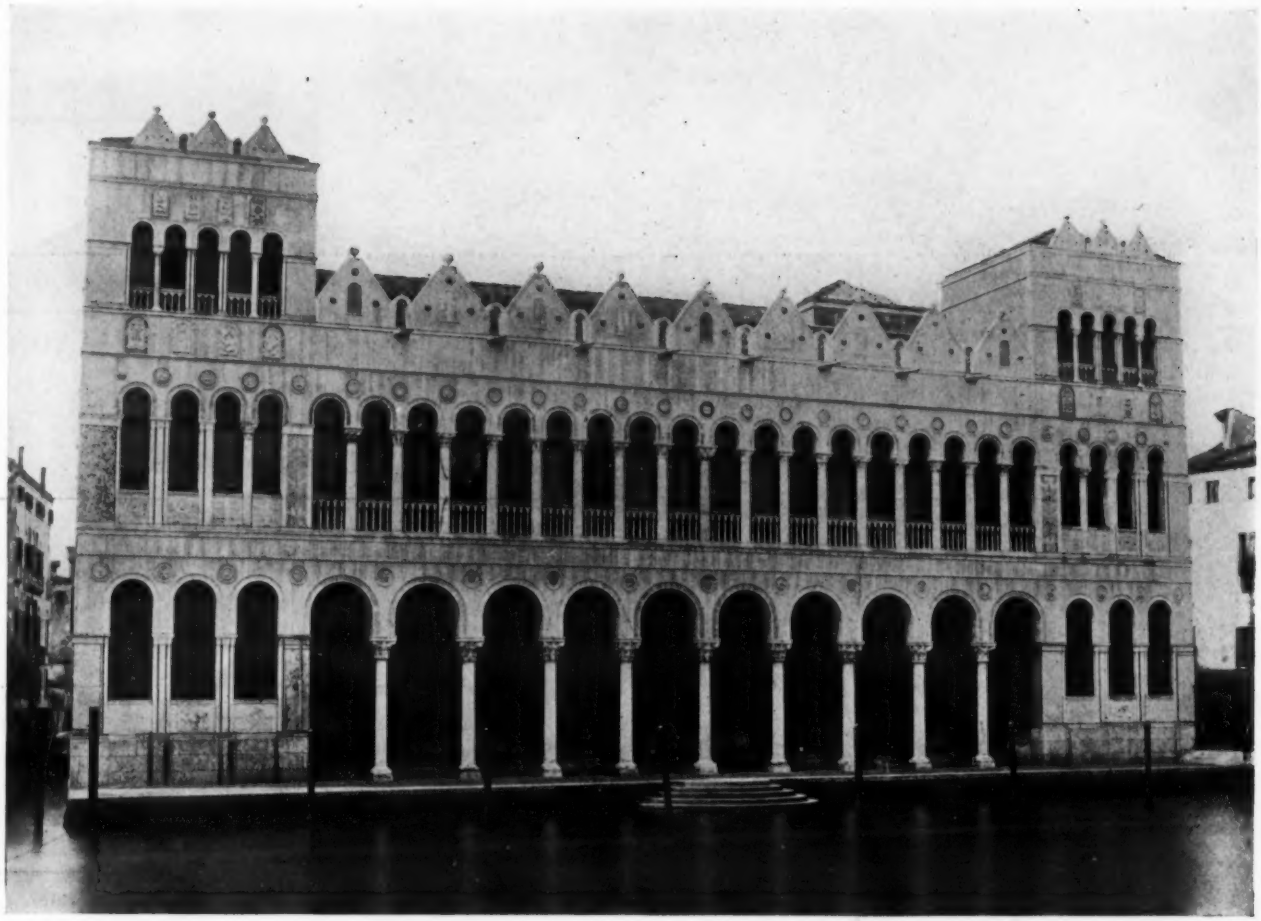

MUSEO CIVICO, VENICE, ORIGINALLY THE RESIDENCE OF THE PESARO FAMILY

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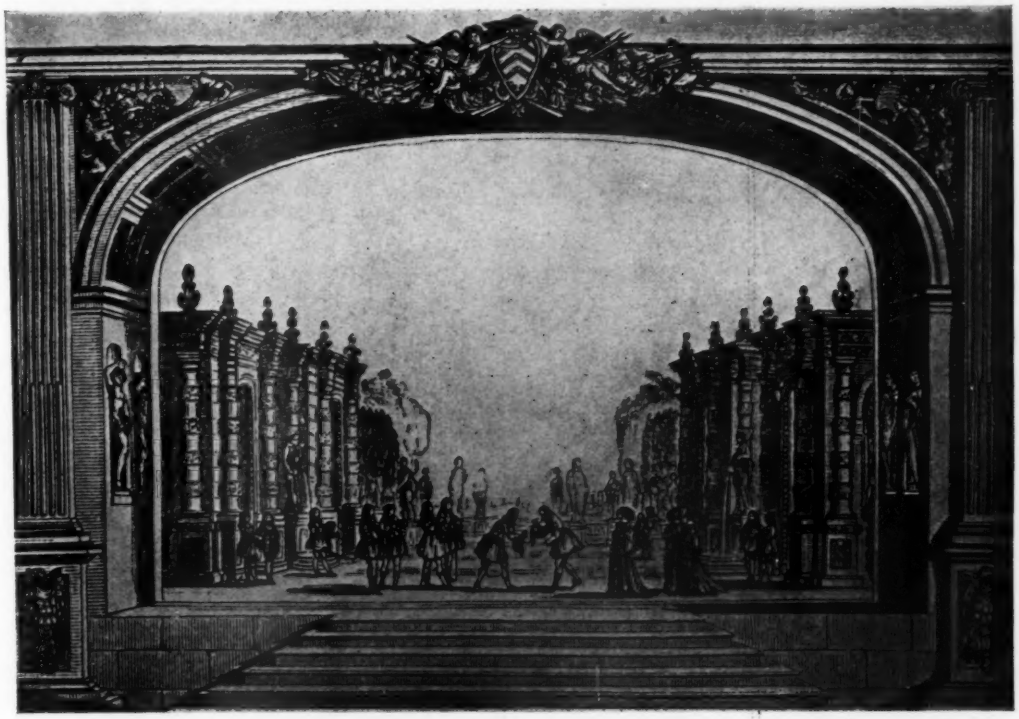

RICHELIEU'S THEATRE, PARIS

OCCUPIED BY MOLIERE'S COMPANY FROM 1661 TO 1673. NOTE THE PAINTED PERSPECTIVE. MANY STAGES IN CONTEMPORARY AMERICAN SCHOOLS AND SOCIAL CENTERS ARE LESS MODERN THAN THIS ONE

Stage Design in Communal Buildings

By GEORGE M. P. BAIRD

I

THE PROBLEM

IF THE reader will imagine himself suddenly deprived of modern draughting-room appliances and forced to execute important commissions with the primitive equipment of the elder Upjohn or Inigo Jones, he will have some conception of the plight of the dramatic craftsman who attempts to produce a play or pageant upon the kind of stage usually found in American school buildings, community centers, town halls and parish houses. The term *stage* is used by courtesy in this relation, for to apply it seriously to those open platforms, shallow, low-ceiled alcoves, and cramped half-domes, with their array of curse-provoking inconveniences —aprons, roll-curtains, hardwood floors, lamp-brackets, windows and impossible entrances—is to handle the truth very carelessly indeed. Judging empirically, the auditoria and stages in our communal institutions are either particularly disingenious and disingenuous afterthoughts (which have been added by way of luxury and not until every

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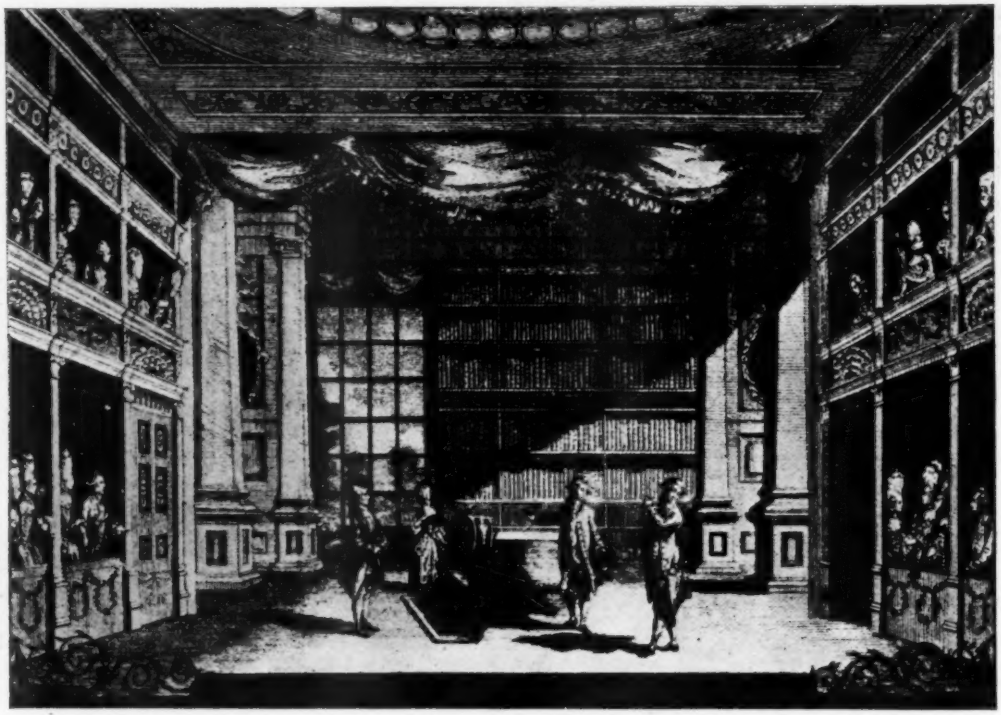
other requirement of the structure has been satisfied); or weird devices to provide for widely dissimilar activities such as drama and basket-ball. The curious but not infrequent combination of stage and gymnasium, stage and class-room, or stage and studio, seems to be dictated by some mystical theory of economy, incomprehensible to ordinary mortals but highly favored by building committees and by architects of the "Yankee Inventor" school. Like the instrument which combines a tooth-brush, corn-



DRURY LANE THEATRE, LONDON, 1778

SHALLOW STAGE AND DEEP APRON, THE TYPE STILL FOLLOWED IN MANY COMMUNAL BUILDINGS. VERILY, WE ARE A CONSERVATIVE FOLK AND LOVE THE ANTIQUE!

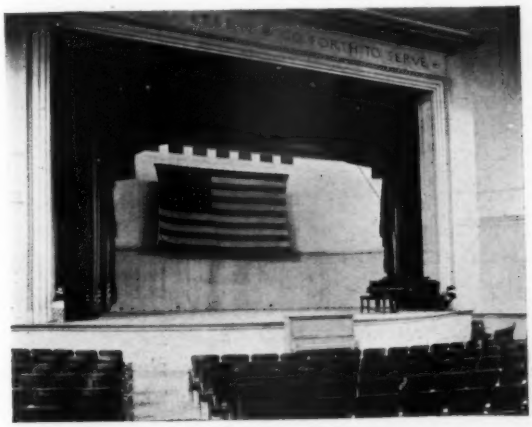
razor and blacking dauber, it is novel and compact but quite useless. In striving to serve many purposes, it serves none satisfactorily.

In older, darker, Puritan-ridden days, when drama and deviltry were considered synonymous, and when accommodation for the lyceum lecturer, the graduating class or the Sunday school chorus was the sole desideratum, an elevated floor at one end of a room and a slight specialization in wall treatment about it were, perhaps, sufficient. Those days, happily, are no more. A younger generation with new ideals and more liberal ideas has arisen to demand that *all* the resources of art and science shall be made to contribute to personal and social progress. It has demonstrated the inadequacy of the old pedagogy and the old theology which made penal institutions of schools and torture chambers of churches and which failed utterly to secure that community consciousness and expression without which democracy is a sad and futile abstraction. It is learning to humanize and vitalize instruction —academic, religious, and civic—by a pragmatic adjustment of intellectual and artistic forces to the actual mental and emotional processes of the individual and of the group. It is reclassifying values on a basis of social utility; and is discovering that many things once looked upon as mere ornaments, are fundamental necessities, while some things fondly cherished as essential, are worthless or even dangerous.

The auditorium with its vital point of focus, the stage, is no longer a luxury with only infrequent usage to excuse its existence. It has become the very heart and center of the building, the common meeting-place of the people, the crucible in which the materials of a new society are being fused and

mingled. The stage is the community hearth where are enshrined the *lares et penates* of the folk. Before it, the group spirit is warmed to life and made socially coherent and articulate through response to the stimuli of thought and beauty experienced in common. Drama and its sister arts, music and the dance, have ceased to be mere entertainment and have become intellectual and spiritual dynamics for the re-creation of the mind and soul of man.

Unfortunately, the physical development of the communal stage has not kept pace with the evolution of social and pedagogical technique. The new methods are hampered or thwarted by blind traditionalism and stupid inertia in plant design. For this condition two factors are responsible. The first is the cock-sure ignorance of trustees, governing boards and building committees. The second factor is the careless architect who fails to grasp the real problem, neglects to confer with the people who are to use his work, copies features from other buildings without ascertaining their practical worth, or too readily accepts the committee's assertion that it knows exactly what it wants.



"THERE ARE CRIMES AND CRIMES"

This shallow alcove is the so-called stage of an otherwise ultra modern high school building recently erected at a cost of more than one million dollars.

Almost one-third of the floor area extends beyond the proscenium in the form of an apron, but there are no flies or wings. This stage is utterly useless for the type of dramatic work which is rapidly becoming so important a factor in secondary education.

The true architect is never too busy to study his work thoroughly and never too proud to seek advice upon matters in which no one expects him to be a specialist. When he is commissioned to plan a building in which a stage is a feature, he will consult all available data and secure expert opinion before beginning his design. It is with the hope of being helpful to such a one that these articles are written. They make no pretense to completeness or final authority. Their only purpose is to point out some of the problems of the modern communal stage and to suggest means looking toward their solution. Where there is much darkness, even a tiny light is blessed.

The fundamental prerequisite to the proper design of an auditorium and art-stage for a church, school or other community building is an intelligent and sympathetic appreciation of the needs and objective of the dramatic craftsman who is to use the plant. To achieve this, the architect must understand something of modern art-stage theory and practice, and he may get his information partly from books and partly from some competent dramatic technician of the new school. Books on the subject of stage design *per se* are few in number and deal, for the most part, with obsolete types or with problems of commercial-stage construction. To be sure, there is a formidable literature of the art-theatre available, and treatises such as those of Hiram Kelly Moderwell, Sheldon Cheney and Irving Pichel, offer excellent approaches to the subject; but there is as yet no single authoritative text which treats of its purely technical phases in comprehensive fashion.[1]

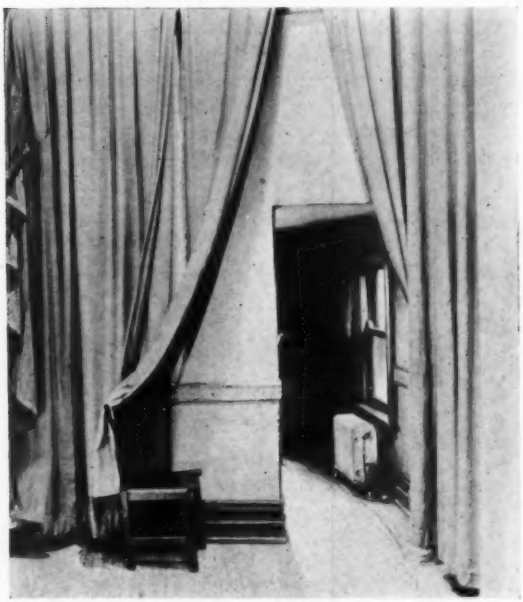
A HORRIBLE EXAMPLE

The "stage" in a large, well endowed memorial Settlement House. It has neither flies nor wings, but the worthless apron with its band of exposed foot-lights has not been forgotten. The draperies are a pathetic attempt to make up for architectural blunders. Behind them (rear wall) are four windows and two radiators. The stage floor is maple, laid over reinforced concrete, and is raised five feet above the auditorium level so that chairs may be stored under it.

The Art-theatre Movement originated as a gesture of protest against the æsthetic squalor, intellectual degradation and economic philistinism of the commercial stage. Its travail of becoming was a slow and painful one, for it had to combat the inertia and fear of change which opposed it from

1. *See Bibliography, appended to Article No. 3 of this Series.*

without and, at the same time, to free itself from the incubi of vague theory and dilettantism which attach themselves to every new enterprise in the world of art. It had to evolve a philosophy, create a technique, and invent the physical tools for the attainment of its ends. The equivocal sanctions, outworn conventions and unplastic machinery of the old theatre were utterly inadequate to accomplish the new ambition for dynamic beauty, intellectual honesty and free artistic expression. The



THE TYPICAL "DRESSING ROOM"

Another view of the Horrible Example. Through the doorway may be seen a portion of an alleged dressing room. An iron spiral stair leads to a similar room above. The stage can be reached only through the auditorium and the lower room. This is not an extreme example of bad design in school and community buildings.

barbarous unrealities of two-dimension trees arranged in false perspective to simulate a forest; the painted *drop* across whose rigid clouds and constant-colored mountains the shadows of actors moved like the wraiths of gods and jötuns; the pink rococo ball-room with its painted mouldings, *center fancy, grand stairway, conservatory backing,* rag *borders* and doors of cloth; the garish frame of garland-daubed *tormenters* (highly appropriate term), and sham drape; the picture curtain —perhaps with a chaste border of advertising— upon which the scenic artist had been encouraged to do his efficient worst; the hideous glare of footlights, abetted by gallery *calciums* and star-pursuing *spots;* a'l the tawdry rubbish of the Nineteenth Century stage had to be cast out and supplanted. Nor could the art-theatre tolerate the equally idiotic, *naturalistic school* (falsely styled *realistic*) of which Mr. Belasco is high priest and prophet; since in its fanatical insistence upon truth in the minutiae of detail it has succeeded in producing only a grotesque ensemble which is a monstrous inartistic lie.

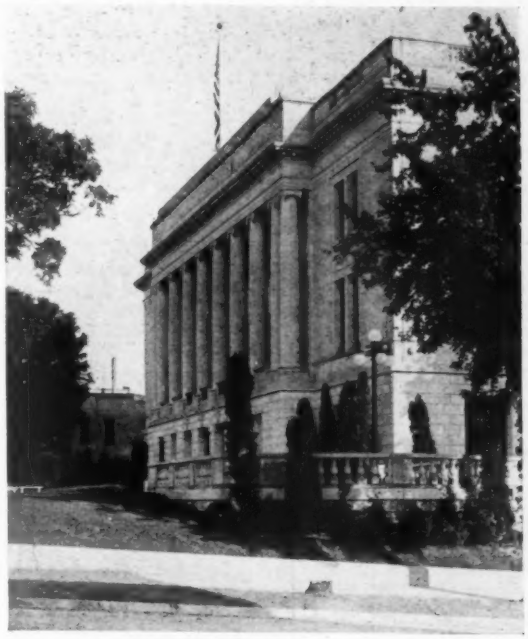
The art-theatre endeavors to be realistic in the psychological sense; that is, to give the work of play-maker and actor a setting which shall neither distract nor obtrude, but which shall enhance the mood and enforce the message of the drama. Its business is to quicken a purposeful emotion by the aesthetic presentation of truth; and this it achieves through the medium of a pan-technique in which the old arts of poet, actor, musician, choreographer, artist and electrician are integrated and co-ordinated to form a new art. This insistence upon synthetic creation, unity of emotional appeal, totality of effect and economic simplicity of means, differentiate it sharply from the traditional stage with its intellectual dishonesty, ugliness, lack of balance, meaningless extravagance and dollar damnation. It asks for but little in construction and equipment, but it demands that that little shall be appropriate to its needs. Its plant must be adequate, adjustable, economical to build and to maintain, and simple enough to require a minimum of operative personnel. It requires little more space than do the useless makeshifts so popular with builders and need not exceed them in cost. The art-theatre has come to stay, and the designer of communal buildings, scholastic, ecclesiastical or social, will profit by making it his serious study.

The Preble County Court House, Eaton, Ohio

H. H. Hiestand and Richards, McCarty & Bulford, *Associated Architects*

COUNTY court houses in this country can be divided into two distinct groups, those erected before and after the Civil War. Those erected in the earlier periods are largely of the Colonial style of architecture. Even in the pioneer days when the counties were limited in means, almost to the degree of nothing, there is evidence of careful designing and an honest effort to produce the best architectural effect possible. Many of these buildings were constructed, in the Central States at least, without the supervision of an architect—an architect as understood to-day—but by that man who was architect, contractor and craftsman c o m b i n e d. That man has now been displaced and with him, apparently, the ability to construct those simple and dignified buildings that please even when located in proximity to pretentious modern buildings.

Court houses erected in the newly developed territories immediately after the Civil War, and in replacing the old buildings in the older communities, seem to display a rare exuberance, a quality which has obtained almost until this day. This was due to the rapidly increasing wealth of the country, the disappearance of the old-time craftsman-builder, the appearance of the architect of that day, political conditions and an unbounded faith in the future. These architectural monstrosities are yet in plentiful and painful evidence. They are of that architectural genius which is identified by the imposing, in size only, colonnades and pediments executed in one of the "orders," ill shaped and useless pavilions and unspeakable domes topped off with a galvanized iron statue of justice, blindfolded and holding a pair of scales and a sword. Rivalry between the counties did not tend to improve the architectural mediocrity of that period. After a passing dash of Romanesque, architectural sanity began to develop.



VIEW FROM NORTHWEST

The court house of to-day may be said to comprise everything the old one did not include. The plan is based on service rather than an attempt to achieve a grandiose effect; permanence and durability are secured through the methods of construction employed; mechanical and sanitary appliances and conveniences are adequate to all demands; the architectural design is in keeping with and comparable to the best efforts of the day. The selection of the architect is made on a basis of competence rather than skill in political manipulation; competitions are more often based on the recommended practice of the American Institute of Architects; juries of award are usually competent and carefully selected.

Of the new type of court house is that one recently erected at Eaton, Ohio, and Preble County may well congratulate itself in the possession of it. It is carefully planned, well constructed and its exterior and interior appearance satisfies the most critical demands.

The building is 79 ft. by 147 ft. in size and is placed 70 ft. from the lot line. The construction is of the best fire-resisting type; the heating, ventilating, lighting and plumbing systems are adequate; the exterior is of buff Bedford stone, the interior marble, wainscoting and stairs are of pink Tennessee marble and the floors of public places are of gray Tennessee marble, other floors generally of terrazzo; such wood finish as is used is of American walnut.

The basement is used for storage purposes, me-

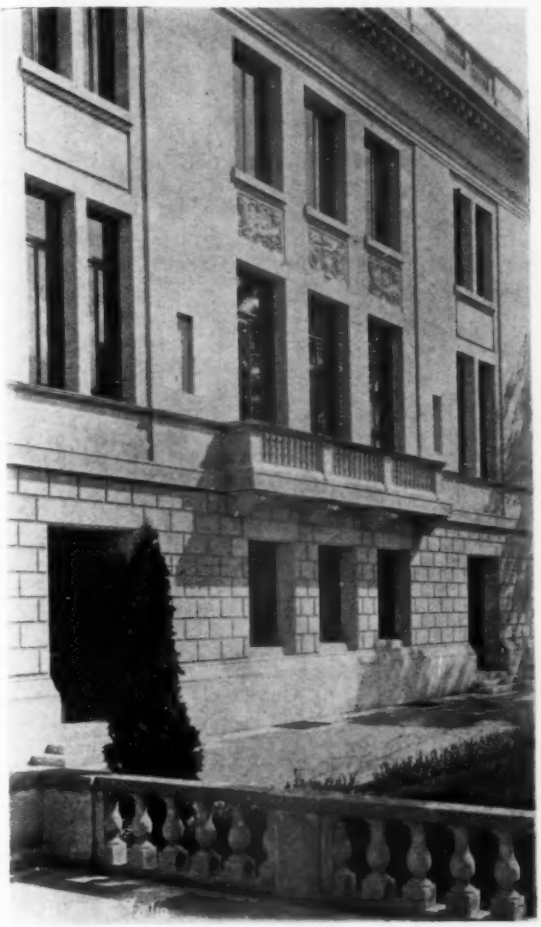
GROUND FLOOR LOBBY, LOOKING SOUTHWEST

VIEW OF VESTIBULE FROM GROUND FLOOR LOBBY, LOOKING NORTHEAST

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*

chanical equipment and has a women's comfort station accessible by an exterior stairway. The principal room on the ground floor is an assembly hall 32 ft. by 71 ft. in size, equipped with a large platform and fixed opera chairs 298 in number. The main office of the County Superintendent of Schools can be opened into this hall and affords extra seating capacity. At the east end of the building is located the G. A. R. room, which is nearly one-half the size of the assembly hall. A women's lounging or rest-room with adjoining toilet room are also provided. Such rooms are commonly provided in such buildings of recent design. This same service to women is now common in the country banks erected in recent years and is a development of community service. A few minor offices and Red Cross quarters occupy the balance of this floor.



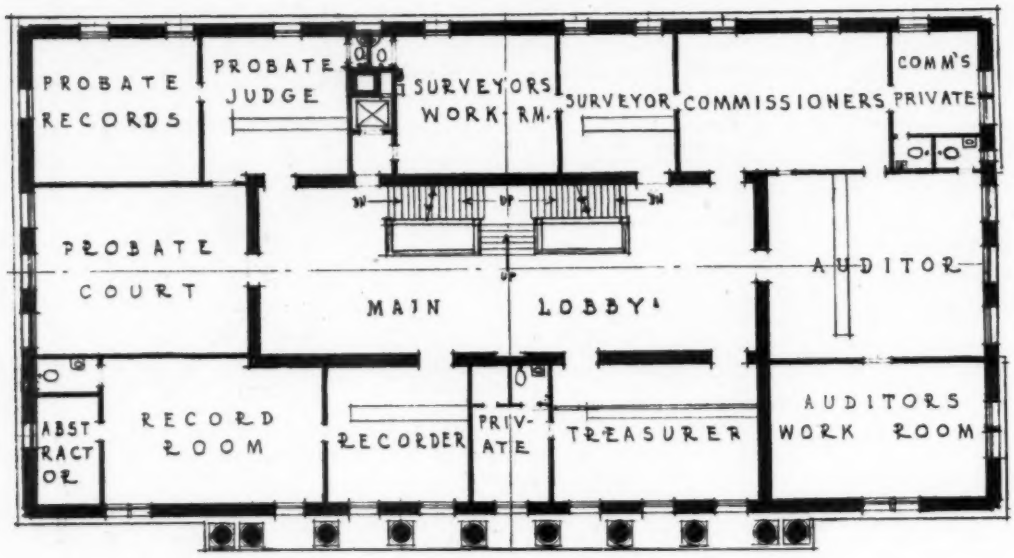
WEST ELEVATION

On the first floor are located those offices which are most commonly used by the public, consisting of the Probate Court, County Surveyor, County Commissioners, Auditor, Treasurer and Recorder. These departments are supplied with the necessary private offices and toilets.

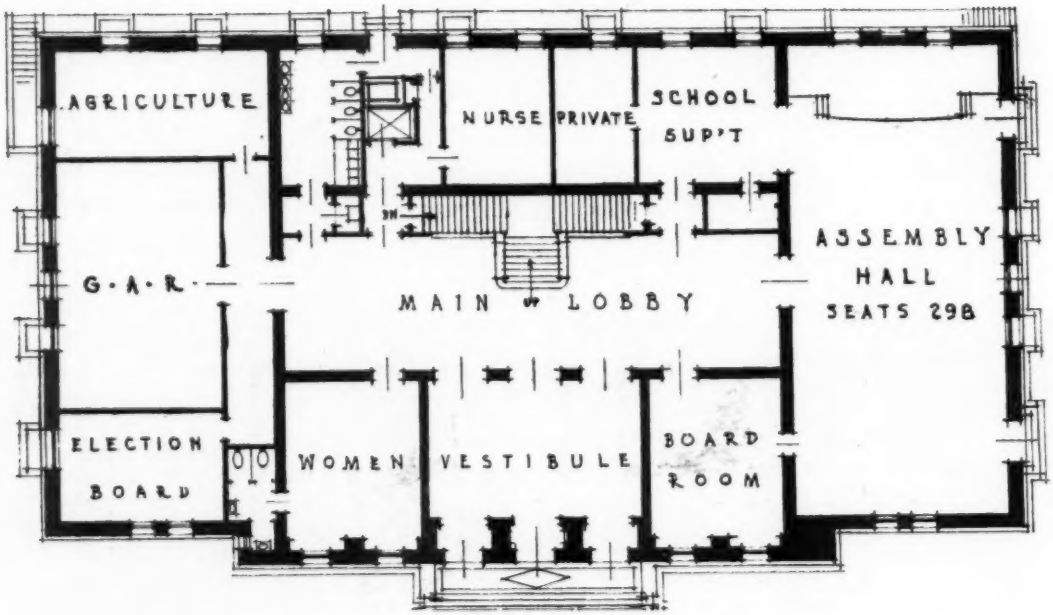
On the second floor is located the Court of Common Pleas, judges' chambers, jury and witness rooms, Prosecutor's, Sheriff's and Court Clerk's offices. There is also a law library and reading room located on this floor.

On the roof is located the county jail, which is not seen from the streets. The Sheriff's quarters, consisting of five rooms, are located along the south wall and have a fine outlook. The men's jail consists of eight cells and the women's jail of two

NORTH CORRIDOR, SECOND FLOOR



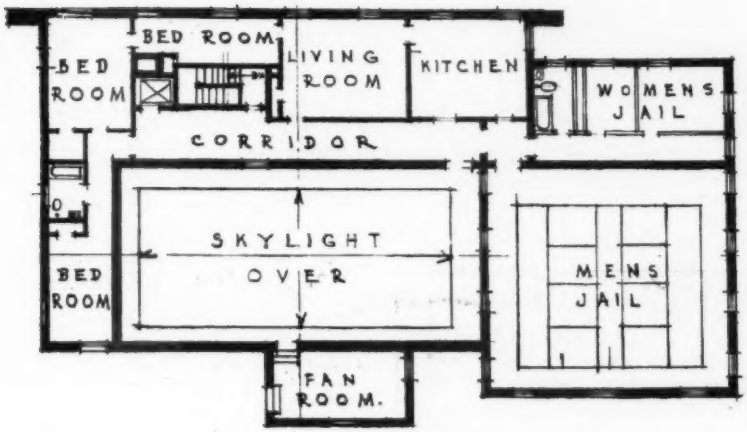
FIRST FLOOR PLAN



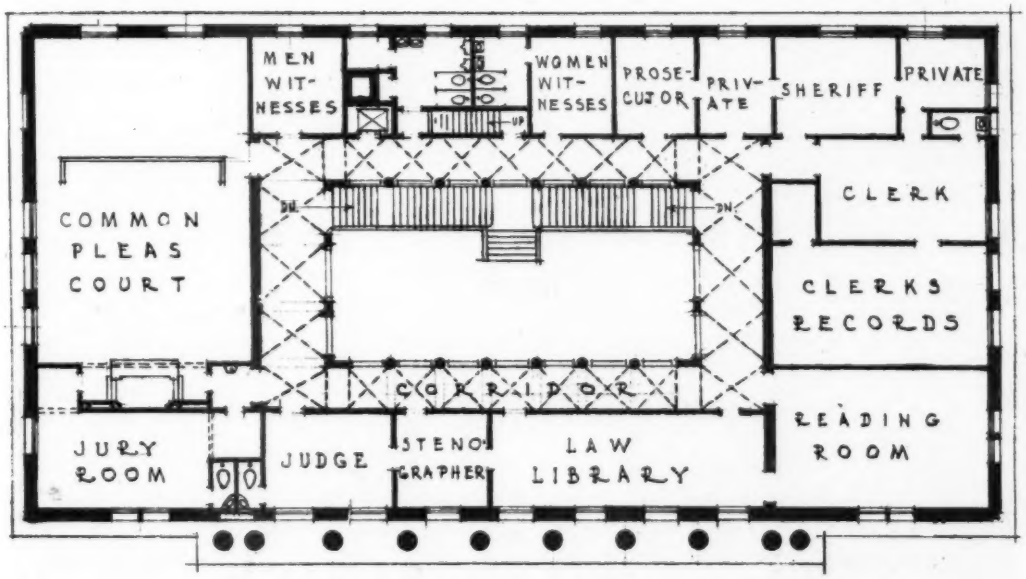
GROUND FLOOR PLAN

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*



THIRD FLOOR PLAN



SECOND FLOOR PLAN

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*

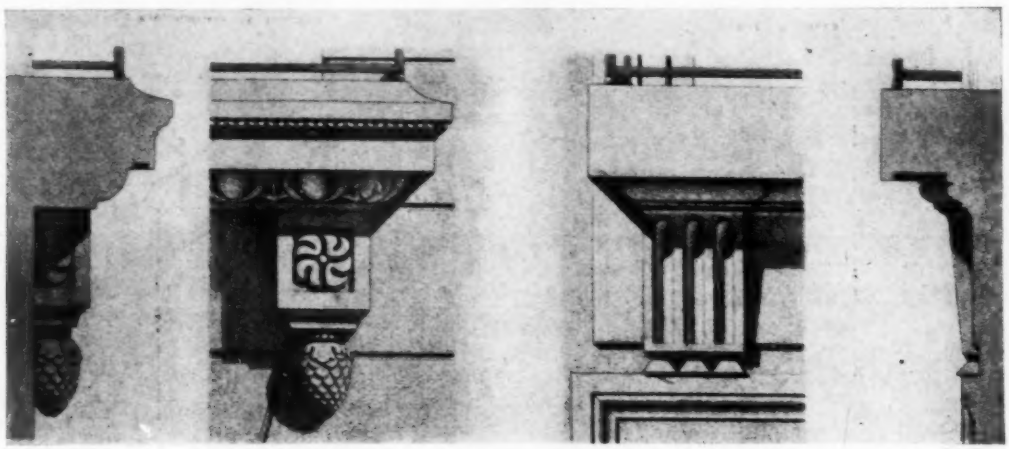
cells. Access is had to the jail through a door on the rear or south side and by means of an elevator and the main stairs. This scheme of combining the court house and jail results in considerable saving in operating and maintenance expense and is entirely satisfactory in rural communities where prison requirements are very limited.

The exterior of the building is designed with extreme simplicity; the general proportions, the openings, the colonnade, balustrades, cornice and parapet give evidence of very careful study and the effect is entirely satisfactory. The main elevation is to the north and has a colonnade of ten Ionic columns extending through the first and second stories, resting on the massive masonry wall of the ground-floor story. The paved approach and terrace with its stone balustrade complete the setting of this very pleasing elevation. The other elevations are comparatively plain but equally as well designed, the west elevation being accented by the use of a balcony at the first-floor level. Three carved spandrels at the second-floor level complete the extra ornamentation of this elevation.

DETAIL OF FRIEZE
SECOND-STORY MAIN LOBBY

The entrance vestibule and main lobby of the ground floor are very simple in design. The wall surfaces are plain, the ornamentation very limited and the satisfactory results are secured by the proportions of the rooms, the arched openings, the ornamental panels at each end of the vestibule and the lower portion of the main stairs. The main lobby on the first floor extends through the second story and is lighted by a large skylight. On the second floor is an open corridor on the four sides of the lobby. This corridor has a grained ceiling and the arcade separating the corridor from the lobby consists of round or square columns resting on the second floor with sections of detached balustrade between them. The main lobby is so proportioned and designed as to give an impression of a much greater size than it really possesses.

This building, with its simple and chaste details, its substantialness and quiet dignity, must ultimately make its influence noticeable in the community. Fortunate is any rural community which can be in daily association with a structure of this kind. The resulting appreciation for the good in architecture must eventually exert a beneficent influence on many buildings of various kinds that will later be constructed throughout the adjoining country.



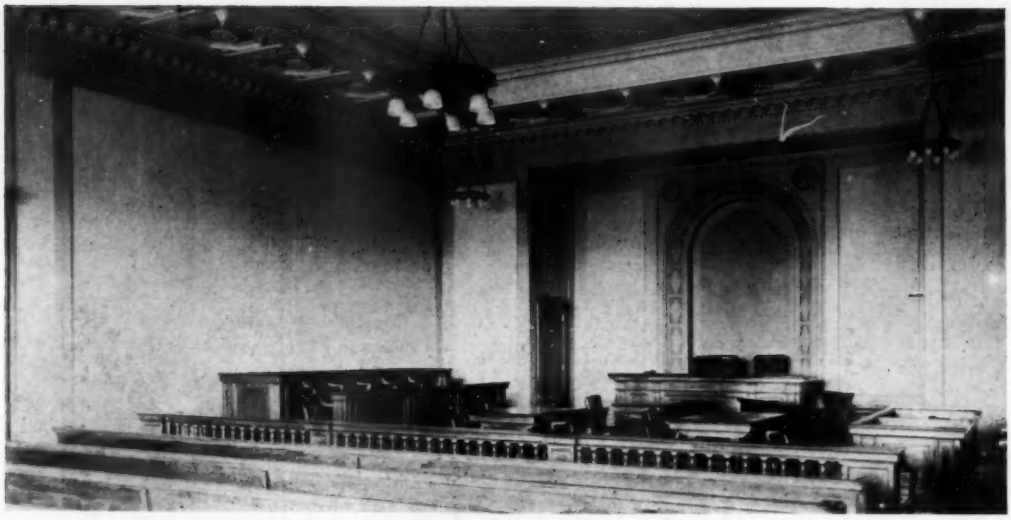
SMALL CONSOLES FROM PARIS BUILDING (LOUIS XVI)
(From The Architectural Journal)

EAST CORRIDOR, SECOND FLOOR, LOOKING SOUTH

LOBBY, LOOKING WEST AT SECOND FLOOR LEVEL

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*



COMMON PLEAS COURT

VIEW OF GROUND FLOOR LOBBY FROM THE VESTIBULE

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*

EDITORIAL

Wisconsin Sets a Good Example

THE action of the Wisconsin Chapter of the A. I. A. in unanimously instructing its Executive Committee to call a convention of registered architects of the State to consider the formation of a State Society is strongly to be commended. The example might be followed with the best results by Chapters in every State where State Societies do not now exist.

The most laborious work incident to the organization of a State Society was practically eliminated by the Committee on State Societies of the Post-War Committee when it framed and made available a model constitution and by-laws. This well constructed document can safely be accepted by all the newly organized State Societies. It has everything in its favor. But the greatest thing of all is that its general adoption would serve coherently to organize these important bodies and relieve them of the conflicting and often directly opposite interpretations which now so seriously affect the smooth working of the various State licensing laws. The more carefully this question of State Societies is considered, the more important it becomes.

The Institute as at present organized, with the addition of State Societies in every State, all under the control of the Institute, would bring the entire profession into a completely organized body. The Institute would then assume its proper relation to the profession, for it would become in the truest sense a representative organization.

Just what will be the attitude of the forthcoming convention toward this important matter cannot be foretold.

That State Society organization is of first importance needs no demonstration of proof.

"Kidding" Themselves

THE purist of English will insist that there is vulgarity in the use of the vernacular. This may, or may not, be true, but we learn from a recent statement in a public address by Lord Reading that the vernacular as used in the United States afforded a very decided emphasis to the use of words and, as he said, gave them a "punch."

There is a growing tendency to "kid" ourselves. This tendency exists in domestic life where the forming of a good resolution is seemingly the important thing, its carrying forward to a final result not so important. In business it takes the form of "conferences," those time-wasting deliberations where men, gathered around a long table, emulate the "three tailors of Tooley Street," and pass no end of well-framed resolutions or pronunciamentoes, which rarely get beyond the minute book of the recording secretary.

Organizations "kid" themselves in the same way. Take the Institute for example. How hopefully everyone who was present at Nashville returned to his home. How generally did each delegate and those who were directly interested in the upbuilding of organized architecture "kid" themselves. Dozens of well-considered resolutions were passed, any one of which if carried forward to a successful end would have made a record for accomplishment.

Consider the resolution favoring the better architectural development of farm buildings. For more than a year previous to the Nashville Convention THE AMERICAN ARCHITECT had been trying to set afoot a movement that would accomplish a necessary reform in the architectural expression of our rural communities. When the Convention passed a resolution favoring all the things this journal had advocated, and in fact incorporated into the resolution that the method of procedure was to be along the lines as urged by THE AMERICAN ARCHITECT; the editors returned "kidding" themselves with the fond hope that at last something was to be done. Hope is seriously deferred. The resolution sleeps on the pages of the minutes of the Convention. A year has elapsed and nothing has been accomplished.

Is it better to travel hopefully than to arrive? Some optimistic individual has said it is. We should, at least, travel.

Report of National Commission of the Fine Arts

THE Eighth Report of the National Commission of the Fine Arts, covering the eighteen months from January 1, 1918, to July 1, 1919, has been issued. Architects will find a compelling interest in this admirably prepared public document. Three of the eight members of the Commission that prepared this report are of the profession of architecture. They are Charles A. Platt, William M. Kendall and John Russell Pope.

There is a further reason for satisfaction to architects in the commendable work of this Commission. It is undoubtedly through their accurate knowledge of conditions as affecting the future development of Washington that the L'Enfant Plan has been preserved in its essence and carried forward as far as possible to its execution.

We have it on the authority of Glenn Brown, as set forth in his article on Roosevelt and the Fine Arts printed in THE AMERICAN ARCHITECT'S issues of December 10 and 17, that the creation of this Commission some eleven years ago was due to the efforts and influence of The American Institute of Architects. It was not difficult for that body of representative and influential men who were then at the head of the Institute to secure the warm cooperation of President Roosevelt and through his vigorous influence the creation of a Fine Arts Commission.

The wisdom of such a course has been many times demonstrated. The conservation of good art and the elimination of that which was bad has been the work of this Commission. The work has been carried on in the most thorough and satisfactory way.

Prominence in the report has been given to the plans for the future development of Washington. The preservation of the L'Enfant Plan has called for all the power that this Commission could command. Every embryonic statesman who has lacked some vital issue to keep him on the front page of the daily papers has tried his 'prentice hand in an effort to amend or change this plan. Real estate interests have sought to distort the zoning instructions and gain permission to erect structures that would have been ruinous in their effect. Even Government officials, many in high office and who should have known better, have approved the erection of buildings on space set apart as park areas. The emergencies of the war when buildings were erected in Washington on all available land showed in the most emphatic way just what would happen to the correct working out of the plan if its basic principles were ignored.

Through all these onslaughts the Fine Arts Commission has quietly but firmly exerted its authority with the result that whatever is saved to-day toward a future logical development of the capital of the Nation is due to the Commission's work.

THE history of the inception and growth of the Lincoln Memorial and a description and illustration of the architectural design and decorative treatment of this splendid tribute forms an important part of the report. Here again we learn that it was through the efforts of the architectural profession that this monument was secured and that it was by reason of the well directed influence of the Institute that the scheme was not abandoned for another and less satisfactory method of commemorating the greatness of Lincoln.

In fact, throughout the entire report there can easily be traced the very strong influence that architects have exerted in the correct development of good art in this country. In many cases the influence has been a direct result of purely individual action and not through the medium of the organized body. A revival of the spirit which made the weight of the Institute's influence something to be reckoned with is a development to be desired and worked for. It is equally desirable that the next convention should take a long step in advance to prove that it has awakened from the lethargy of the past few years.

Towers of Babel

EVER since New York began to realize that it was a metropolis its architecture has been of two highly divergent types, one of which perhaps deserves to be called the leisure class. Churches, private houses and governmental buildings could as a rule take whatever form seemed good to their designers, so we have a sort of architectural museum with samples of styles from every country and every age. Some of them, most notably specimens of the classic type, such as the Columbia University Library and the Pennsylvania Station, specifies the New York *Times,* look as if they belong here; others, which it would be invidious to specify, certainly do not belong here, and a good many of them do not belong anywhere. But buildings of a more practical character had to be governed by other considerations, and so came our one domestic type, the skyscraper. Sometimes it tried to be Gothic or Romanesque or Renaissance when it had lifted itself above its neighbors, like a self-made man going in for culture late in life, but for all this belated conformity it remained native and peculiar.

Yet presently it was discovered that a city of skyscrapers would not be particularly healthful for those who had to live and work in it, who never saw the sun and rarely breathed fresh air unless it were loaded with street dust. So the building regulations, lately adopted as we know, prescribed that above a certain height building fronts must be set well back from the street, and higher up there must be still another recession. Thus light and air are guaranteed in some measure for those who live in the lower stories; and New Yorkers who have seen the first buildings of the new type approach completion have been surprised to find that our native architecture has reproduced exactly one more ancient and foreign type—the Babylonian ziggurat, or temple tower of stages. And this is not merely another addition to our historical museum; as economic pressure compels the building of more and more modified skyscrapers New York will become a city of ziggurats.

The archæologists tell us that these towers on the plan of Babylonia offer clear proof that the earliest civilized settlers must have come from the mountains. They brought with them their tribal gods who had been worshipped on the mountain top, at a shrine reached by the windings of a mountain road. There were no mountains in Babylonia, so pious newcomers invented the ziggurat as a sort of artificial mountain, with the footway leading up over the roofs of the successive stages to the shrine at the top as the successor to the spiral trail of the mountain country whence they came. The Scriptural explanation is simpler: the ziggurats were put up as a sort of defiance of nature and God, a proof of men's capacity which was promptly punished by a jealous deity.

Early tradition is usually wrong, and even archæologists are sometimes wrong, but man insists on drawing inferences from whatever evidence is at hand. So let us look ahead two or three thousand years, and imagine the traveler from New Zealand stopping in the Hudson Valley on his way home after sketching the ruins of St. Paul's from a broken arch of London Bridge. From his inn at Piermont or South Norwalk, or whatever may be the urban center of the neighborhood by that time, he will sally forth with a digging party of Appalachian peasants and amuse himself by working in the ruins of the ziggurats which are to be found in such numbers on what was once Manhattan Island, before the harbor was silted up by the discharge from the city sewers after six weeks of snow-storms.

How will the New Zealander explain them? He may hit upon the right explanation, of course, but he may not; for all we know, there were building regulations in Sumer and Akkad. He may regard them as symbolic of an aspiration toward heaven, like a Gothic spire; but the lamentable lack of evidence of any such feeling in the surviving fragments of the literature of the period will compel him, or at any rate will compel his professional colleagues, to reject that theory. Obscure texts provisionally dated 1920 may contain such dark passages as "wet wave gathers strength," and a whole school of excavators will dispute whether a succession of tidal waves overwhelmed the city and compelled its residents to take refuge on the higher stages of their temple towers, or a gradual subsidence of the surface of the island—a view supported by allusions of ancient writers to "billions sunk in subway"—compelled its inhabitants to make this frantic effort to lift themselves out of reach of the Atlantic. For all we know, the future may see such a development of social equality that our New Zealander will understand by "upper classes" only those who lived in the upper stories.

Even a theological interpretation is possible; the name "skyscraper" may be construed as indicating a dissatisfaction with the management of the universe, an aspiration toward the overthrow of ancient divinities and the enthronement of a man. The New Zealander may live in a more pious age than ours, and see in the decline and fall of Manhattan some such divine judgment as the author of Genesis laid upon the builders of Babel. We can only guess and guess badly; Naram-Sin and Lugal-Zaggisi would have been sadly disappointed if they could have foreseen how little our time was to know of their splendors. But a contemplation of the disputes which will certainly distract the archæological circles of New Zealand in the fortieth century should be edifying and corrective to those followers of lost causes who appeal with such sublime assurance from present defeat to the verdict of history.

Protective and Operative Features of the Emergency Contract

By MAJOR RALPH H. CASE, U.S.A.

(*Concluded from issue April 21*)

Had the old lump sum contract been used, before the plans and specifications could have been drawn, the National Guard would have been sleeping in the mud, with death and disease rampant in its ranks, and the great selective service army would have been beating upon doors yet unhung and crowding under roofs unswung. Our great war program would have received at its inception an irreparable blow, a fatal delay. No sane contractor would have made a lump sum bid on a job running into several millions in those troubled days. No sane Government would have considered such a bid if made. Contractors, who stay in business, figure not less than 10 per cent profit on lump sum work. What was the actual per cent of profit paid to contractors of the 32nd National Army and National Guard Camps? The actual figure is 4 per cent, which is a clear saving in operation of at least 6 per cent on the total cost, produced solely by the Emergency Contract.

But by virtue of the Emergency Contract the camps were built, and this contract is the vehicle through which success was attained. Before the men could reach the camps the camps were ready to receive the men. In ninety days from a cold start housing was provided which accommodated more than three and one-half million men. Not only housing but every convenience and facility, and every detail of sanitation and protection.

The cost of the camps—16th National Army, 16th National Guard and special Camps, built under this contract—when placed alongside the service by them rendered, was so low that it stands as the least expensive of the major items of the war. The actual per capita cost for men housed in the camps was $69.81. This is not quite $10 more per man than the discharge bonus of $60 per man and that bonus was a gift which by many is regarded as inadequate.

But the Camps have not been given away. Seventeen of them have during the war become the property of the United States through the Construction Division of the Army. Fourteen of the National Army Camps (Cantonments, properly) have been bought by the Construction Division out of money saved from funds allotted for the construction of the Cantonments themselves. A large sum of money was saved in construction and in reducing construction work. This money could not have been saved under a lump sum form of contract as the latter obligates the definite amount for definite work. The millions saved were available for the purchase of the Cantonment Sites, were withdrawn from the field and reallotted for the purchase of the land. The fact is the Fourteen National Army Cantonment Sites, costing nearly Nine Million Dollars, are the gift of the Construction Division of the Army to the people of the United States, and this was made possible by the Emergency Contract. These Cantonments alone represent an investment of $155,000,000. and are worth today as a salvage proposition at least Fifty Millions of Dollars, 98 per cent of which would have been dissipated had those Cantonments been demolished and the lands returned to their former owners. These Cantonments remain an asset to the diminished army. They will house the new army, and they are the centers of whatever kind or degree of training may finally be decided upon. These, then, are the things done through the Emergency Contract, in addition to furnishing the wealth of protection set out in the Fourteen Points:

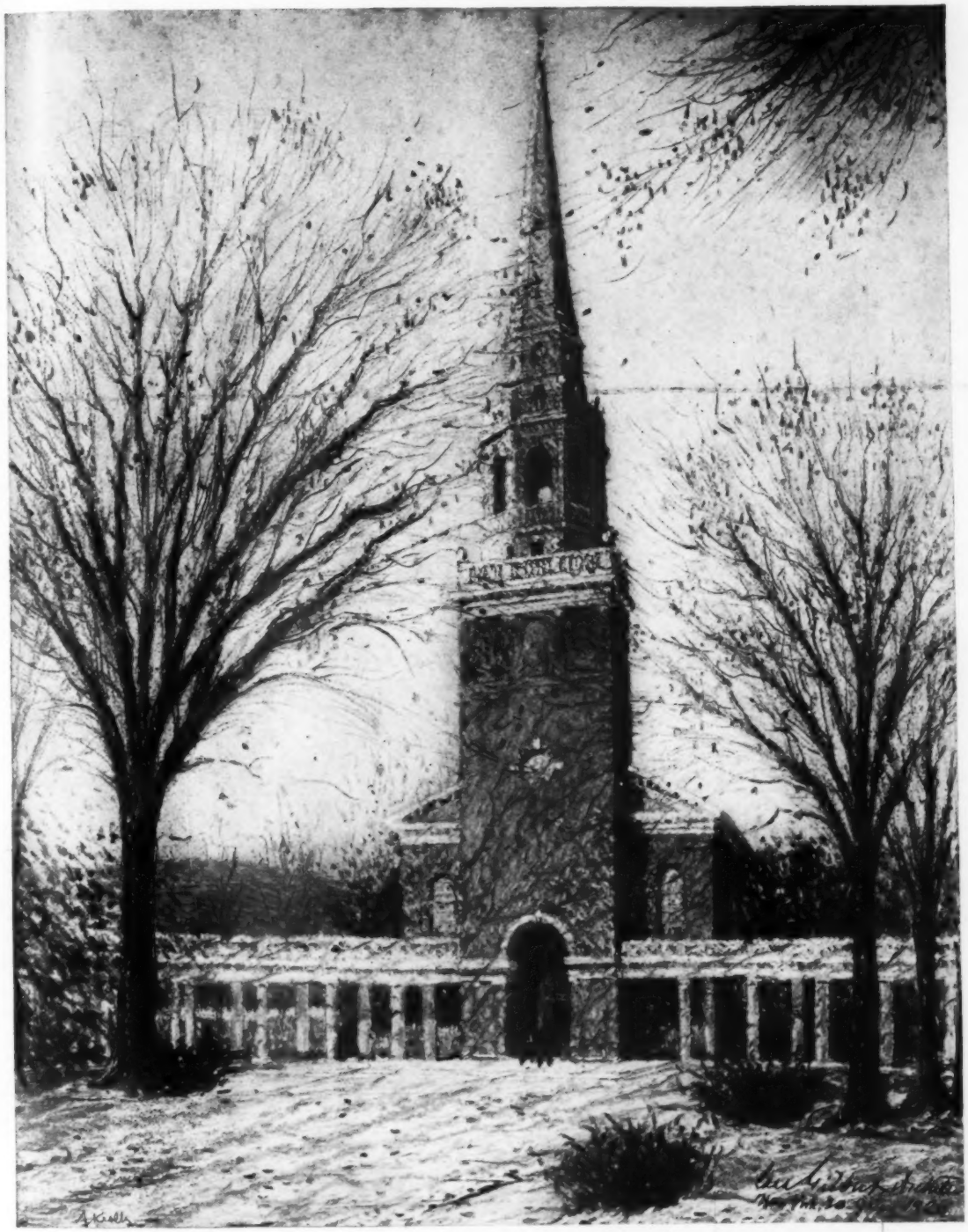
The Camps were built in time.

The per capita cost was the lowest.

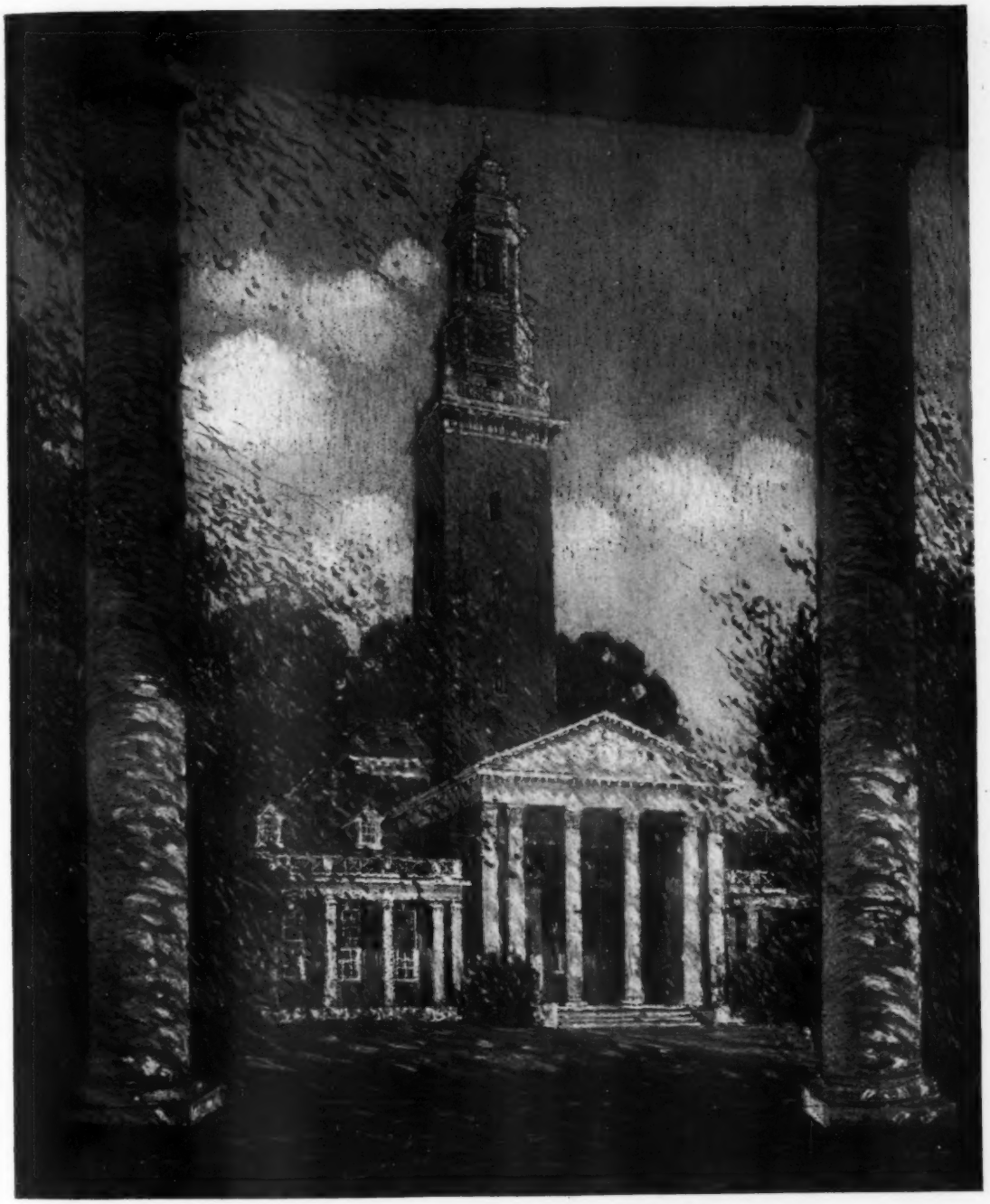
The profits to the Contractors were less than half of normal.

The Fourteen National Army Camps were given to the Government.

This is a record both in protection and in accomplishment which will stand as one of the brilliant achievements of the Great War, an achievement recently characterized by the Secretary of War as second only in effect to the ferrying of two million men to France through the submarine zone.

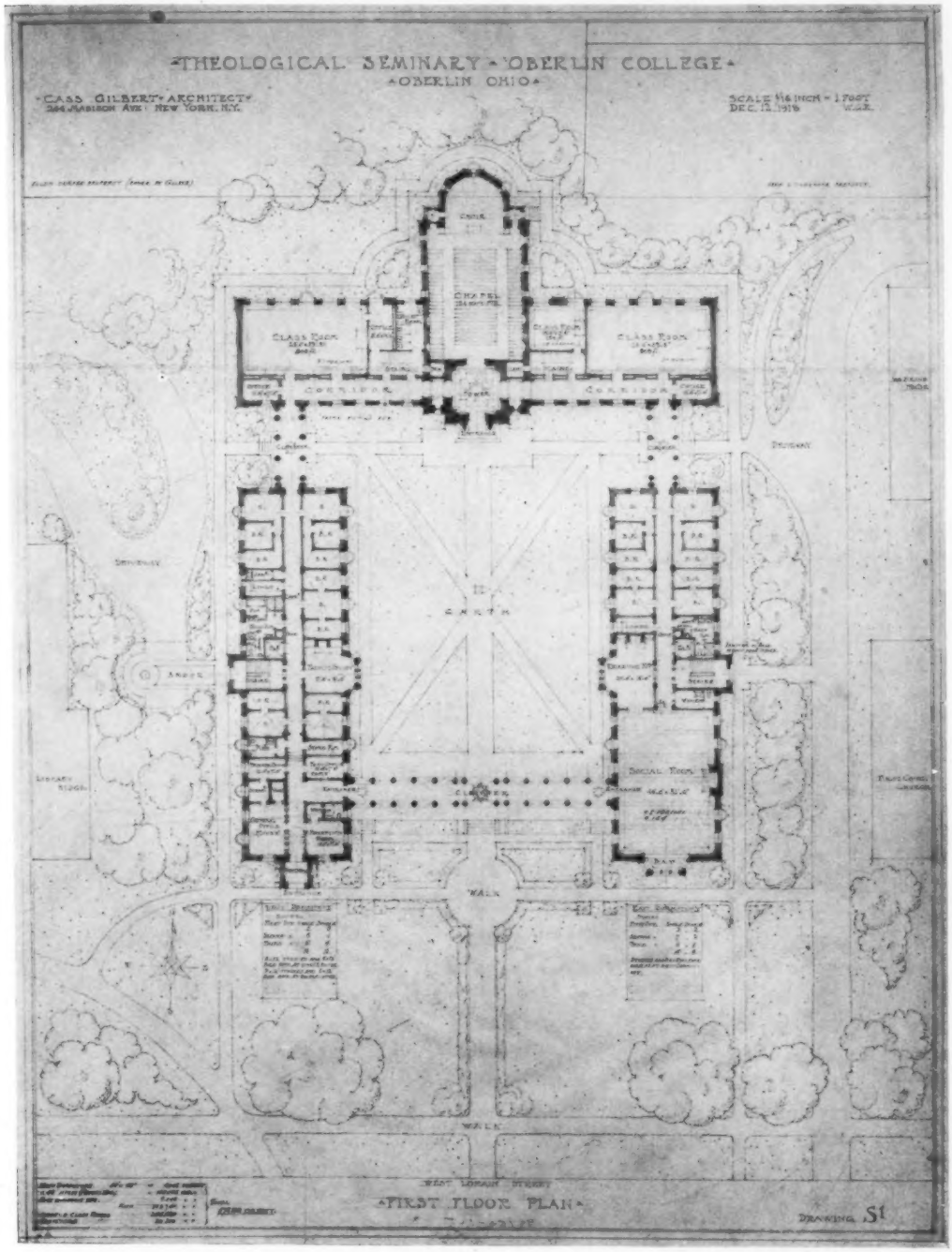


THE CHAPEL, HOTCHKISS SCHOOL, LAKEVILLE, CONNECTICUT
CASS GILBERT, *ARCHITECT*



MEMORIAL TOWER, HOTCHKISS SCHOOL, LAKEVILLE, CONNECTICUT
CASS GILBERT, *ARCHITECT*

THEOLOGICAL SEMINARY, OBERLIN COLLEGE, OBERLIN, OHIO
CASS GILBERT, *ARCHITECT*



GROUND PLAN

THEOLOGICAL SEMINARY, OBERLIN COLLEGE, OBERLIN, OHIO

CASS GILBERT, *ARCHITECT*

BUILDING OF THE ATLANTIC REFINING CO., PHILADELPHIA, PENNA.
CASS GILBERT, *ARCHITECT*

VIEW FROM NORTHWEST

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*

CLOSE-UP OF NORTHWEST CORNER

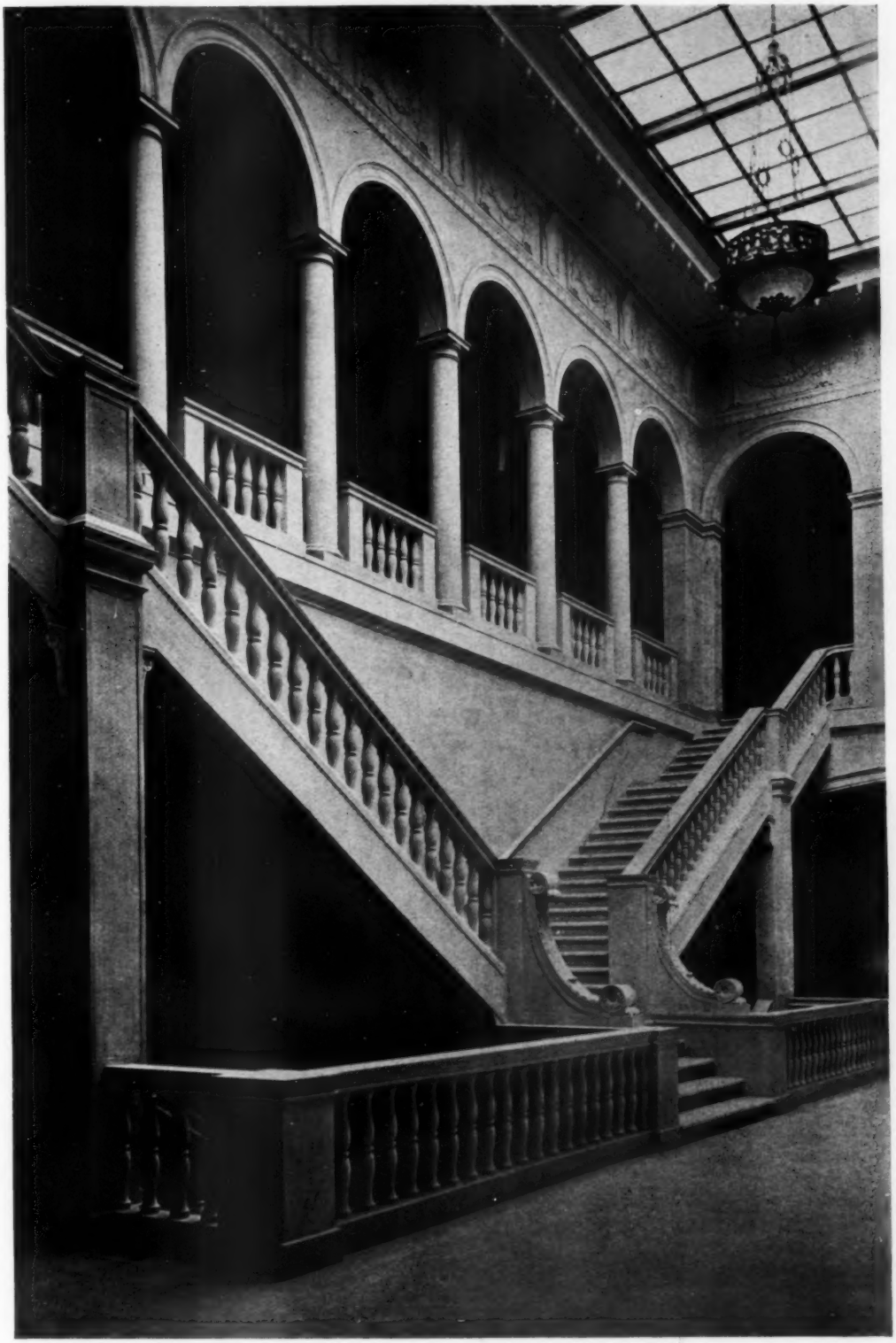
PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*

A MAIN ENTRANCE, NORTH ELEVATION

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*



FIRST AND SECOND STORY LOBBY, LOOKING SOUTHWEST

PREBLE COUNTY COURT HOUSE, EATON, OHIO

H. H. HIESTAND AND RICHARDS, McCARTY & BULFORD, *ASSOCIATED ARCHITECTS*

Current News

Happenings and Comments in the Fields of Architecture and the Allied Arts

Minneapolis Architects Form Society

Members of the architectural profession in Minneapolis have long believed that both the profession and the city would be served and benefited by the existence of a society comprised of Minneapolis architects, architectural draftsmen and architectural engineers.

As the result of the energetic work of several architects this belief has finally crystallized in the formation of the Architectural Society of Minneapolis.

The new organization already has a membership of about sixty. Not only is it the purpose of the society to encourage closer professional and social association among the Minneapolis members of the profession, but to devote time and thought to the study and solution of those civic problems for which their training and experience fit them, and also to co-operate with the master builders of Minneapolis in the mutual study of problems of the day affecting various phases of the building industry.

An atelier will be organized for the study of architectural design under the direction of Mr. Leon Arnal. The methods of the Beaux Arts School of Paris, of which Mr. Arnal is a graduate, will be followed. Since September Mr. Arnal has been in charge of instruction in architectural design at the University of Minnesota. He is a veteran of the Great War, with a record of full four years' service in the French army.

Following are the officers of the society: President—Jefferson Hamilton. Vice President—R. V. L. Haxby. Secretary—A. O. Larson. Treasurer—Floyd Brown. Directors—James Forsythe, Harry Downs, George F. Poulsen.

The society meets at present at the Lincoln Club, but will have permanent quarters in the Hewitt & Brown Building, now under construction at Twelfth street and Second avenue South.

Artistic Designs in Industry

Who is to blame for bad design in our manufactures? asks the *Architects' Journal* of London. The manufacturer says the public are at fault. They prefer bad designs, and the manufacturer must meet the demand. On the other hand, there is a very considerable section of the public that prefers good design, but cannot get it. What, then, is to be done? In the course of a discussion of the subject at a conference of manufacturers and distributors of house fittings convened by the Society of Arts, Mr. C. Tennyson, deputy director of the Federation of British Industries, threw out the very practical suggestion that the manufacturer should "get in touch with an artist of good standing, originality, and common sense, and give him a good position in his factory as a sort of art director." That is very sound advice, and would secure good results provided it were adopted in the right spirit. It is to be feared, however, that in many instances the manufacturer would want to "boss" the artist, who, if he were worth his salt, would not endure the process; while the man weak enough to stand it would simply obey misguided orders. What is the matter with British manufacturers of the old school is their headstrong obstinacy. This the Royal Society of Arts is making an earnest endeavor to overcome; while the British Institute of Industrial Art is giving every possible assistance in the campaign against the bad art which, if it continue, will tarnish the nation's industrial reputation. Britain cannot afford to let this happen, as it will, unless manufacturers become more sensitive to the commercial value of the art that they seem to despise. They have not yet realized what Ruskin dinned into the ears of their fathers forty years ago—that beauty has a high commercial as well as a moral and an ethical value.

This attitude is one that our American institutions should more thoroughly share. It is always productive of good results to enter into friendly competition in things of this sort. England is waking up to the importance of certain truths. Will America sleep on?

Burnham Library Open at Art Institute

One of the happiest events in the history of the year at the Art Institute is the opening of the new Daniel H. Burnham library in the space just south of the Ryerson library. Describing this in the Chicago *Evening Post*, L. M. McCauley states that this handsome reference and reading room for architects seems to have been conjured from the limited area of a corridor which has the effect of being enlarged in the transformation. Under the direction of Howard Shaw, the architect, as well as trustee of the Art Institute, the introduction of barrel vaulting and lofty arches give the apartment a stately appearance. Long, narrow windows with leaded glass admit daylight and specially contrived indirect lighting from alabaster bowls hung from the ceiling afford a pleasant illumination.

Midway in the south wall a panel has been reserved for hanging the portrait of Mr. Burnham, painted by Anders Zorn. It is a realistic presentment, illustrating the vigorous interpretation peculiar to the Swedish artist. The canvas was painted when Zorn was in Chicago and Mr. Burnham in the prime of life. A second portrait of the celebrated architect, in a sympathetic mood, painted by Oliver Dennett Grover, is prized by his fellow architects in their collection of portraits hanging in their clubroom at the Art Institute.

A valuable library of books, prints and all sorts of publications relating to architecture given by the late Mr. Burnham to the Art Institute is the nucleus of the collection installed in the new library shelves. Other acquisitions of the same character have been assembled here with comfortable reading desks and tables for the use of students of the architectural school and all others who are interested in this subject.

The Daniel H. Burnham library catalogs 2,400 volumes on architecture. As a man of creative genius and vision Mr. Burnham labored for and saw the Chicago of the

future. Through his efforts and under the inspiration of his enthusiasm the present wide movement of a city beautiful was put under way. Mr. Burnham had the gift of drawing other men to him and of imparting to them his dreams. In the bequest of the records of architecture something of his presence seems to linger and to hallow the atmosphere. His personal service to the arts of the city, his encouragement to young artists and his undying faith that the noble and the beautiful would survive preserve his memory as a living force among those with whom he labored and to whom he wished to pass on the torch of tradition.

West of the reading-room of the Burnham library the corridor has been rebuilt for the use of the photograph department of the Art Institute, which lists over 36,000 prints and 19,427 slides, including many of architecture. Here, too, are the beautiful Arundel and Medici prints for the use of those who are studying the arts of the past. Both photographs and lantern slides are available for loans.

"Bungalow" is Bengalese

We get our word "bungalow" from the Hindu word "bangla," which really means Bengalese, but which refers to a Bengalese thatched hut, states the Oregon *Journal*. The British officers in India, being unable in out-of-the-way stations to secure lumber, frequently built their houses of bamboo. The original form of the bangla or bungalow consisted of a large and lofty room with double walls of bamboo, with canvas partitions to form the bathroom, storeroom and bedroom and having a wide porch surrounding the bangla. We have modified the bungalow in this country until its Bengalese ancestor, the one-storied, single-roomed, porch-surrounded bangla would not recognize its American descendant.

Competition for Library Building

A competition for a new branch library building to cost $100,000 will be held by the Board of Trustees of the Free Public Library of Jersey City, N. J., the secretary of which may be addressed for further details. The competition will be open until August 16.

In Memory of Stanford White

The trustees of New York University, whose library building was designed by the late Stanford White, long ago conferred upon him an honorary degree. More recently, it is learned from the New York *Tribune*, they have accepted the offer of a group of his friends to erect in his memory a pair of bronze doors at the entrance to the structure, which remains one of the finest products of his art. The plans for the development of this tribute were decided upon at a meeting held at the Century Club on December 1, 1919. They recognized a peculiar appropriateness in the form of memorial presented in these doors to be placed on University Heights. The architect's father, Richard Grant White, the distinguished Shakespearean scholar, was a graduate of the university. The design for the doors was made by his son, Lawrence Grant White, now a partner in the old firm of McKim, Meade & White. No more felicitous manner could have been chosen for the perpetuation of the architect's name and fame. He will be commemorated, too, by just such a collaborative process as he loved. Throughout his career, White was wont to call in the services of sculptors and painters. He had for them, indeed, the sympathy of a man initiated into the spirit of their mediums. John La Farge once told how White in his youth had come to him with the aspirations of a painter. He urged him instead to devote himself to architecture. The advice, as we know, was justified, but White never lost his gusto for the other arts. When he was building the great baldachino in the Church of the Paulist Fathers he had MacMonnies model the three angels and entrusted the sanctuary lamp to Philip Martiny. The famous portal for St. Bartholomew is another of many instances of this policy of his. Hence it is fitting that the same policy should govern in the building of the new university doors. Eight of the panels in them will contain seated figures in relief, typifying the arts and sciences, and they will be modeled by sculptors formerly associated with White. Two will be done by Andrew O'Connor, two by Herbert Adams, two by Philip Martiny and two by A. A. Weinman. The scheme to be thus carried out was inaugurated by a committee embracing the following names: James Barnes, James L. Breese, Winthrop Chanler, Thomas B. Clarke, Royal Cortissoz, Devereux Emmet, Allen W. Evarts, Henry W. De Forest, Robert W. De Forest, C. Dana Gibson, Cass Gilbert, F. L. V. Hoppin, Charles B. MacDonald, Clarence B. Mackay, William R. Mead, Willard L. Metcalf, De Lancey Nicoll, Charles A. Platt, Frank K. Sturgis, Lloyd Warren, Whitney Warren and Arthur Weekes. The smaller executive committee is composed of the architect, Thomas Hastings, who is chairman; the sculptor, Frederick MacMonnies; the painter, Thomas W. Dewing, and W. Franklyn Paris, secretary. The funds for the memorial are being raised through private subscription.

Chicago's Building Plan

To enable 5,000 tenants to build permanent two-flat buildings through a Civic Loan Association is the plan launched last week at a meeting of the Chicago Real Estate Board's Committee of Fifteen. Public-spirited citizens will subscribe $15,000,000 to the corporation and loans equalling 80 per cent of the value of building and lot, with $6,000 as the maximum figure, will be made to prospective home builders. It was announced at the meeting that $2,000,000 has been subscribed to the fund without solicitation.

The interest rate will be uniformly 6 per cent and real estate board commissions will be charged. The borrower will pay the loan at the rate of $10 per thousand per month, including interest. The term of the loan will not exceed five years, but at the expiration of the five-year term the company will agree to extend further the term of any loan in good standing.

Under the committee's plan the board of directors will employ a head architect, head builder, head appraiser and a general sales manager of the loan department. It is proposed to devise 400 to 500 sets of plans for these buildings, and it is believed that the restoration of the people's confidence in building will be greater under this plan than any other.

Art and Science in Engineering

The parts that art and science play in the various branches of engineering was briefly put by Arthur Surveyer in a discussion on engineering education before the recent annual meeting of the Engineering Institute of Canada, printed in the *Engineering News-Record*. Mr. Surveyer, who, in addition to his consulting practice, is a member of the board of directors of the Ecole Polytech-

nique de Montreal, called attention to the fact also that the Ecole is the only engineering school in North America where tuition is given in French. He thus states the case of art and science in the various branches of engineering:

"Engineers can be divided into two great classes, according to the relative importance of the part played by art and science in the exercise of their profession. The building engineers and administrators of certain classes of utilities constitute the first group. This class includes the architectural engineer, the structural engineer, the public works engineer and the engineer builder or operator of canals, harbors, railways and tramways. These technicians apply, in their practice, some of the principles of science, but they also—and this probably to a greater extent—apply empirical rules based upon the experience of others and constituting the art of the preceding generations.

"The second group is composed of the industrial or manufacturing engineers. Their field of action is very wide; it includes the fabrication of all engines and machinery, all the applications of chemistry, such as metallurgy, electro-chemistry, electro-metallurgy and the series of industries dealing with the transformation of materials, such as dye works, pulp and paper manufactures, tanneries, sugar refineries, glass works, potteries, gas plants, etc. It also embraces all the applications of physics to the compressed-gas, cold and liquid-air industries and the ever-increasing number of applications of electricity to the construction of electrical machinery and wireless telegraphy. This group of engineers utilizes science to a greater extent than art, and their formation requires more laboratory work and less *ex cathedra* teaching."

Calls Rebuilt Dwellings "Birth Control Houses"

Thousands of old-fashioned dwellings in Greenwich village, Washington Square and the Chelsea and Gramercy Park sections of New York, which have been remodeled into bachelor, studio and non-housekeeping apartments, are "fire traps, converted in violation of law, and are detrimental to good citizenship and the improvement of the human race," Frank Mann, tenement house commissioner, declared in a statement.

"They may at least be termed birth control houses, since no one brings a family into them or tries to raise one," the commissioner said.

The commissioner declared legal action would be taken as soon as the housing shortage is relieved.

Mud Huts in Berlin

Reversion to the primitive types of dress and habitation in vogue during the Dark Ages is taking place in Berlin, according to a report in the *Literary Digest*. No new dwelling houses, except mud and board shanties, have been built there since the war broke out, we are told. Yet the population has increased to such an extent that four million people are now jammed together in the city where there is not room enough for three million. As a result, communities of ill-clad and sandal-shod folk are said to be living on the edges of the city in thatched-roofed houses of uncooked clay like the adobe huts in uncivilized parts of Mexico and Central America. So great has the demand for these mud habitations become that technical instruction as to how they should be built has been made available throughout Germany.

American Institute's Fifty-third Annual Convention

The fifty-third annual convention of the American Institute of Architects is scheduled for May 5, 6 and 7 in Washington, D. C. Convention headquarters have not yet been given out. William Stanley Parker, secretary, the Octagon, Washington.

Public Buildings

A foreigner who admires America and Americans very much but who is, at the same time, not blind to a few national faults and weaknesses, commented recently on the fact that public and public buildings are so far apart. He believes that there are many beautiful buildings in America. But the people for whom those buildings were erected take very little real pleasure or satisfaction in them. They use the buildings when necessary, but rarely pause to enjoy the architecture or to feel a sense of pride and possession.

Whether it be bank, post office, church or museum, the building itself nearly always fails to become a vital part of the public's wealth. During the period of the building's erection the public is carefully kept outside. When the workmen are through for the day the doors are boarded up and ugly signs are posted announcing "No Admittance" or "Trespassers Will Be Prosecuted" or "Closed" or "Keep Out." Frequently a high board fence is erected to defy even the casual glance of interested passersby.

When the building is completed the public is coldly indifferent. It has acquired the habit of letting the place alone, and goes in only hurriedly to transact the legitimate business of the place.

Of course, it is frequently necessary to protect the laborer's daily accomplishment from souvenir-hunting hands or from the accidental damage which might result from the unrestricted explorings of large numbers of curious citizens. Still there is much truth in the foreigner's criticism. The public should care more about its buildings while they are under construction and should feel more at home in them when they are done. If it is not wise to open up a half-built building for public inspection, at least there could be pictures of its various parts and daily reports of its progress and explanations of its finest features. Then it would become in fact as well as in name, a public building.

Chicago Art Institute Extends Work

People formerly went to the State Fair to see the raw products of the farm. This year they will see the finished product of the best in art, architecture and home decoration.

They will see masterpieces by the greatest living American artists; they will see photographs, designs and plans of houses drawn by the best American architects.

They will be taught how to build a house; how to furnish and decorate a home; how to landscape the home grounds, and how to dress.

The Extension Department of the Art Institute of Chicago has found a new way to educate the people in art through a new kind of State Fair.

Three years ago the Art Institute undertook the job of teaching Americans both in and out of Chicago what art really is and what it is good for. During that time the institute has sent out "art missionaries" carrying an

equipment of painting, furnishings and interiors to seventy-five cities in the United States.

Through the medium of lectures, exhibitions and interior decorating demonstrations the dweller in the smaller cities and towns has been given a new understanding and appreciation of art. These exhibitions and lectures often last five or six days. Sometimes they are given under the auspices of the Chamber of Commerce or Civic Association, again it may be the Own Your Own Home Association that fathers the show. The new feature at State Fairs is the latest development of the plan to carry the Art Institute to the doors of the people.

Model Farmhouse Buildings

On the campus of the Nebraska College of Agriculture there is a miniature farm modeled, designed and laid out to satisfy local conditions. The buildings were designed and constructed by the Agricultural Engineering Department of the college. They include a comfortable, attractive farmhouse, set on a concrete foundation and equipped with modern conveniences; an up-to-date dairy barn with a solid wall concrete silo; a hay shed for alfalfa; a horse barn, a hob house; a tool shed and shop; a poultry house and a machinery shed.

All the buildings are well made. They are ideally located in a well shaded and ornamental yard bordered by a small fruit orchard and garden, and the outlying fields are fenced and laid out as you would find them on a real farm.

The buildings on this farm are built to one-quarter scale. The material from which the buildings were constructed were cut to one-quarter scale in the woodwork shop. The buildings were all constructed on the floor of the woodworking laboratory and later were moved out of doors to their present location. The construction was all done by students in the woodworking classes of the college, under the direction of the professor in charge.

The problem of the well-constructed farmhouse and other buildings necessary for efficient work on the farm, is attracting more and more attention. It is one of the most important phases of the reconstruction of rural life now in progress throughout the country. It is a natural indication of agricultural prosperity and it means that the farmer no longer is contented with the old methods of construction that involved drudgery for the housewife and hardship and discomfort for all the members of the farmer's household. It is a hopeful sign.

Argentina's Building Program

There is a large field for the sale of American construction materials in Argentina, according to a report just made public by the Bureau of Foreign and Domestic Commerce, Department of Commerce, and the investment of American capital in Argentine enterprises is an important factor in securing contracts.

Buenos Aires is in great need of first-class office buildings. Several departments of the Government are being crowded out of their old quarters for lack of space, and modern hotels and apartment houses of the American type are needed. With the return of normal conditions, many model homes for workingmen will also be erected in the suburbs of Buenos Aires. Notices appear in the newspapers of the capital from time to time inviting bids on various public construction enterprises. The time limit for these is usually short; but if American firms were represented in Buenos Aires they could secure many such contracts.

The National Council of Education has adopted a large building program for public schools. The plans to be completed in the next few years call for an expenditure of about $8,500,000. The needs of various cities in the province of Buenos Aires will call for the installation of sewerage and water systems in the near future at a total cost of about $2,300,000.

The various provinces of Argentina have building programs independent of those of the Central Government, says the report, but also receive Federal aid in the execution of many public works. Definite projects in which the Central Government plans to aid the provincial governments in the immediate future call for an expenditure of $10,000,000 for sewerage and water systems alone.

Argentina has always been an excellent market for iron and steel products for construction purposes. Formerly the imports of cement were considerable, but a large cement plant is now in operation about 200 miles from Buenos Aires, owned by American interests. Lime of unsurpassed quality is found in many parts of Argentina, and the plaster of paris used is produced chiefly in the country. Clay roofing tiles and roofing slate and glazed wall and vitrified floor tiles are imported in considerable quantities. Some years ago advertising campaigns were instituted to popularize felt roofing materials, but with only partial success. The chief competitor of this kind of roofing for industrial purposes is galvanized-iron sheeting, for which there is good demand. In the past ten years many skeleton-steel structures have been erected. Architects believe that reinforced concrete will be a strong competitor with this type in the future.

The report, which also discusses the market for construction materials in Bolivia, is the result of a first-hand investigation by Trade Commissioner W. W. Ewing. It is known as Special Agent Series No. 188, "Construction Materials and Machinery in Argentina and Bolivia," and can be obtained at 20 cents a copy from the Superintendent of Documents, Government Printing Office, Washington, D. C., or from any of the district and co-operative offices of the Bureau of Foreign and Domestic Commerce.

Importance of Ample Electric Wiring

Architects are advising their clients to wire new residences and apartment houses for all possible electric uses and future developments, but they have to contend with the same objections that were presented when modern plumbing was recognized as a necessity. The prospective builder is not fully informed as to the present-day use of electrical appliances nor of the reasons why they will become absolute necessities as the cost of portable fuel advances, and he is apt to tell his architect to cut down on the wiring estimates, not appreciating the fact that he is giving instructions for an incomplete job, which will certainly have to be finished at some future time if the house is to be habitable for himself or a salable piece of property.

The time is long past when wiring for lighting purposes will satisfy. The man or woman who is looking for a home is learning to give as close scrutiny to the wiring as to the plumbing.

There must be wire capacity enough to provide for an electric range and hot water heater in the kitchen, and there must be outlets in the dining-room, parlor, library and bedrooms to provide for the use of the smaller electrical devices, such as heater, chafing dishes, hot pads, fans, piano lamps and other movable lighting fixtures. The question is no longer how cheaply can a house be wired, but how well.

Weekly Review of Construction Field

Comment on General Conditions of Economics With Reports of Special Correspondents in Prominent Regional Centers

THE construction of buildings, the production of basic materials and the transportation of such materials from the manufacturer to the dealers and from the dealers to the job are all involved or likely to become involved in the controversies which arise from the demand for more wages. In the larger cities there seems to be no limit to the extravagance to which such demands may be carried.

Four months have passed since the stabilizing agreement in the New York City building trades by which skilled craftsmen were placed at $8 per day. Now the unskilled laborers are setting forth demands for $1 an hour minimum and some of them are scheduled to go on strike. The bricklayer's laborer at $1 an hour is able to work in all kinds of weather. The bricklayer is unable to work on rainy days. This makes it easily possible for the unskilled laborer to earn more than the skilled, which invites more trouble.

The railroad strike has of course tied up the transportation of building materials and the reduced supplies in the yards are practically exhausted. It is commendable that in this situation there was no skyrocketing of prices. The hold-up in railroad transportation seems now to be at an end, but the reparation of the damages brought about by its delays cannot be immediate. The immediate outlook for construction is not encouraging.

IT seems most likely, however, that the public—if there is still a public—will be well aware of the cause of the delays in building by which it is being so seriously inconvenienced. The case is quite plain. The more serious the inconvenience the plainer the case. If one has a comfortable place to live at a reasonable rent, or if one owns one's own home, it is easy to look upon strikes in the building trades with a degree of equanimity. There is getting to be, however, a large proportion of our population which (not knowing where it is going to live) feels vitally interested.

The current issue of *The Nation* carries an article which analyzes the situation of those who are in need of houses and arrives at the conclusion that the necessity of business to make profits and the demand of the workers for profits will shortly bring "a time when business men will frankly come to the community and say they cannot operate the business system, because there are no profits in it. That day has arrived in the British coal mines and railways. It has apparently arrived in housing both in England and the United States. The house of today, as it tries to get itself built, is weighed down by an overlay of golden charges—taxes, profits, interest, every item of material, every stroke of labor."

Undoubtedly the facts are as Mr. Gleason states, but whether the conclusion of the business man which he infers is inevitable is to be questioned. The difficulty with carrying forward a building program is not the high wages, but the undependability of the workers. Should they make an agreement and stick to it, could they be depended upon to work instead of strike, much might be assured of accomplishment which now seems doubtful and a dangerous experiment. It really does not seem necessary or desirable to overturn the whole social system, and it isn't likely that business men are going to throw up the sponge.

AN organization of a building loan association is contemplated in New York with a capitalization of $30,000,000 which shall construct the modest type of house needed by the small salaried class. Of the purchase price—which would be about $2,500—the purchaser would be required to pay 6 per cent annually, in monthly installments; he would also buy stock in the corporation upon the installment plan. His total monthly payments would amount to about $25 and at the end of twelve years he would own the house.

This scheme carries many of the commendable features of "the Detroit Plan" and seems to offer a solution not only in the housing of a population, but toward the settlement of many of the social problems of the day. No one can look upon the accomplishments of this country and say that the principles upon which it has worked are faulty. It is quite as true and must be admitted that the tendency through recent years toward a submergence of individuals into cogs of an industrial system and nothing else lessens their value as citizens. However large their pay or short the hours of work, there is sure to be discontent at such a fate. A job and fat pay envelope, and rented tenement, however sanitary, and a picture show, however exciting, do not make a stable, well-rounded life. The good citizenship is missing. And if from the present crisis we can stabilize not only our markets and wages but our manhood it will have been worth going through. If the tendency to become nomadic is succeeded by the satisfaction of settling down—and this seems a not unnatural reaction—we shall be able to talk of socialism or syndicalism or bolshevism with an expectation of arriving somewhere. After our workers know what it is to have permanent homes they will doubtless find that they have a new perspective upon their place in society.

THE Savings Division of the U. S. Treasury Department states that there are heavy inquiries for the small denomination Liberty Bonds throughout the country. This is believed to indicate that the people who, by thrift, are able to buy these securities have stopped their extravagance and are looking about for sound investment. The demand has become so large that the supply of the "popular" sizes had been reduced and the Treasury Department has issued instructions to the Federal Reserve Banks for the exchange of bonds of larger denominations for those of smaller units.

Lumber statistics from the Northwest show that production for the week was only 1.06 per cent below normal. It is said that an inadequate car supply was keeping shipments below production and preventing the mills from accepting all the business offered to them.

In the steel trade the production for March was considerably in excess of expectations and showed that the

mills had fully gotten into their stride after the setback suffered from the earlier steel and coal strikes.

(By Special Correspondence to THE AMERICAN ARCHITECT)

CHICAGO:—Prior to the calling of the railroad switchmen strike in Chicago ten days ago there had been a decided improvement in transportation, particularly noticeable in increased steel shipment.

Industry had come back after months of coal shortage and transportation difficulties; goods which had been held in warehouses for long periods were moving, and delivery and payment of these helped to relieve the credit situation.

There was a promise of easier conditions for both producer and consumer, and with the increase of supply came indications of lower prices.

But the strike which has spread all over the country has changed this. It has tied up traffic, forced thousands of workers in other industries out of employment, again crippled industry and seriously disturbed the money market.

The housing situation will be rendered more acute as the result of the slowing up in the construction industry.

Though there has been a big increase in building, most of it is being done by industrial concerns. Building awards for Chicago for March, 1920, were $103,267,770, which is over $40,000,000 more than any month in the city's history, but only 19 per cent of this sum was for residence construction.

Home builders cannot afford to pay the increased costs of labor and material which are showing a gain in cost of 100 per cent over those of March a year ago.

Those who are building in suburban districts show a preference for brick or concrete as a building material where formerly nine out of ten buildings were frame.

Permits issued in Chicago in March for 480 buildings involved a total cost of $10,000,000, as against 497 buildings and $5,501,850 for the same month a year ago. During the first quarter of the year 1,084 permits, aggregating $28,699,800, were issued. Last year there were 793 aggregating $8,486,750.

Along with the high cost of construction goes the high cost of borrowing. More than $100,000,000 worth of improvements contemplated by public utilities companies throughout Illinois will be given up because of excessive interest rates. Rates in Chicago are on a 6½ per cent to 7 per cent basis with the banks disposed to limit accommodation wherever this can be done without working a hardship.

The shortage of railroad equipment and extensive labor difficulties continue to hamper.

Chicago is now the nation's greatest army supply station and will continue to be the food center of the American army. With the recent completion of Unit C of the trio of gigantic army supply depots on the south side of 39th between Ashland avenue and Roby street, Chicago will have 1,890,000 square feet of permanent floor space for storing Government supplies. All the meats for the entire army will come to these warehouses.

This permanent depot project, costing approximately $10,000,000 and said to be the largest in the world, grew out of an off-hand suggestion of an army officer that there should be such a depot in Chicago.

Building contracts in the Central West in March amounted to $89,727,000. There has been a steady increase in this district since the beginning of the year, January having shown a total of $61,423,000 and February $78,082,000. The total for the quarter is about double the amount for the same period last year. Of the quarterly total 32 per cent was for industrial buildings, 21 per cent for public works and utilities, 19 per cent for buildings and 18 per cent for residential buildings.

(By Special Correspondence to THE AMERICAN ARCHITECT)

SAN FRANCISCO:

THE present uncertainty as to the price of lumber in the future is somewhat retarding the supply. The lumber yards, awaiting price developments, are at present inclined to delay stocking up. Although the price of lumber remains about the same, there is a question as to whether or not it will be continued. The majority of the San Francisco lumber dealers think that those who expect a drop in the present price of lumber are going to be disappointed. The demand for all the timber products so far exceeds the supply that it is very doubtful if the opening of the Pacific Coast saw mills will affect the price of lumber in the least.

The brick shortage in San Francisco and the Bay Region is forcing the construction men to await their turn for their supply. Many more buildings of concrete construction are being erected than otherwise would be if brick could be obtained in sufficient time to erect them.

Reinforcing material is showing an upward tendency, owing to the large demands that are being made on it.

Construction men and California architects say that they see no slowing up of the demand for more buildings and homes for some time to come.

The supply of labor is as short if not shorter than the supply of materials. However, much of the supply of material is due, so the producers say, to the shortage of sufficiently trained laborers. The construction men are still much in need of more trained men to help them fulfill their contracts on time.

The Isolated Sewage Disposal System

A Type Adaptable to the Country Residence

By WILLIAM C. TUCKER

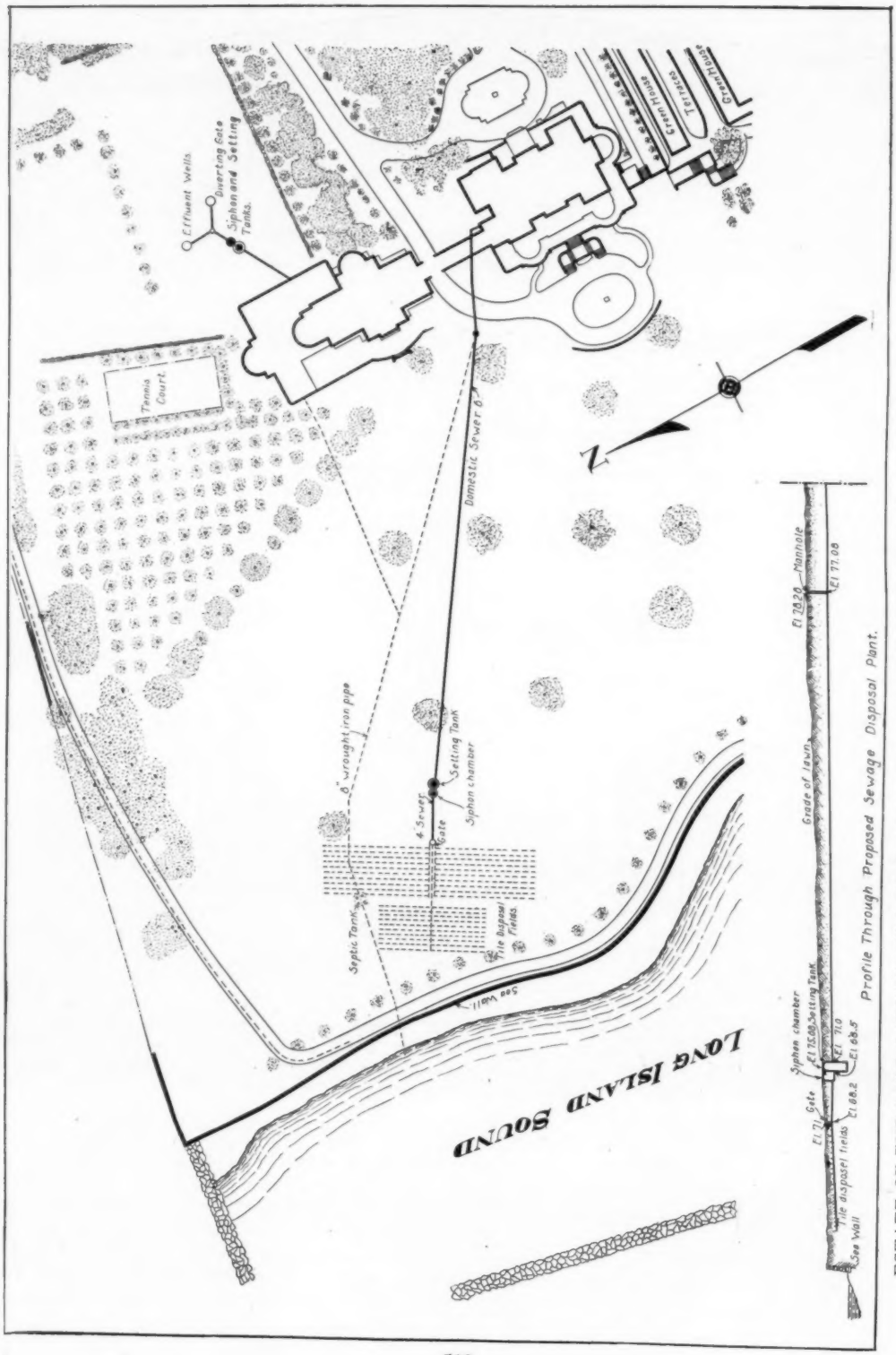
SOME of the choicest residential sites are located in sections unprovided with municipal sewers and, therefore, it is generally necessary for the architect planning such a country home to make provision for a satisfactory method of sewage disposal. Fortunately scientific investigation has resulted in evolving a plan both simple in construction and efficient in operation.

Former methods of draining household waste material either into a cesspool or a nearby stream are no longer countenanced and these methods cannot be too strongly condemned, nor their attendant dangers overemphasized.

The underlying principles to produce complete bacterial reaction are quiescence, sedimentation and the delivery of the material for treatment in as dense a form as is expedient, with sufficient fluid only to hold the solids in suspension so that they may be moved in the sewer with celerity and freedom. To produce these results the sewage must

COUNTRY ESTATE OF THE LATE CAPTAIN DE LAMAR AT GLEN COVE, LONG ISLAND, N. Y.
C. P. H. GILBERT, *ARCHITECT*

Plans for the Sewage Disposal System Are Reproduced on Page 530



ESTATE OF THE LATE CAPTAIN DE LAMAR AT GLEN COVE, LONG ISLAND, N. Y. THE SEWAGE DISPOSAL SYSTEM SHOWN HERE HAS BEEN IN SATISFACTORY OPERATION FOR SEVERAL YEARS

be delivered to a water-tight masonry chamber of sufficient capacity to retain the accumulation of two days' supply. The receiving basin must be so constructed that the movement of the sewage during its passage to final disposal may be leisurely.

To obtain this condition a short masonry wall two feet high is usually built across the bottom of the receiving tank, located at the center, to act as a baffle plate and assist in producing a sluggish and retarded flow. Thus fermentation and sedimentation will be most thorough, accompanied by complete bacterial activity. This action changes the solids into insoluble and mineral components ing basin may be circular in form for smaller units, including those of 600 gallons capacity; if larger, the rectangular form will be found more advantageous. The determination of the water consumption within the house is somewhat difficult and is dependent upon its availability, whether there be running water or not. In the former instance, 60 gallons per head per day may be assumed as a fair allowance. No animal stall or wash table drainage should enter the sewage disposal system, since that from the former contains finely masticated food of the animals, which fails to settle in the receiving basin, causing clogging and seri-

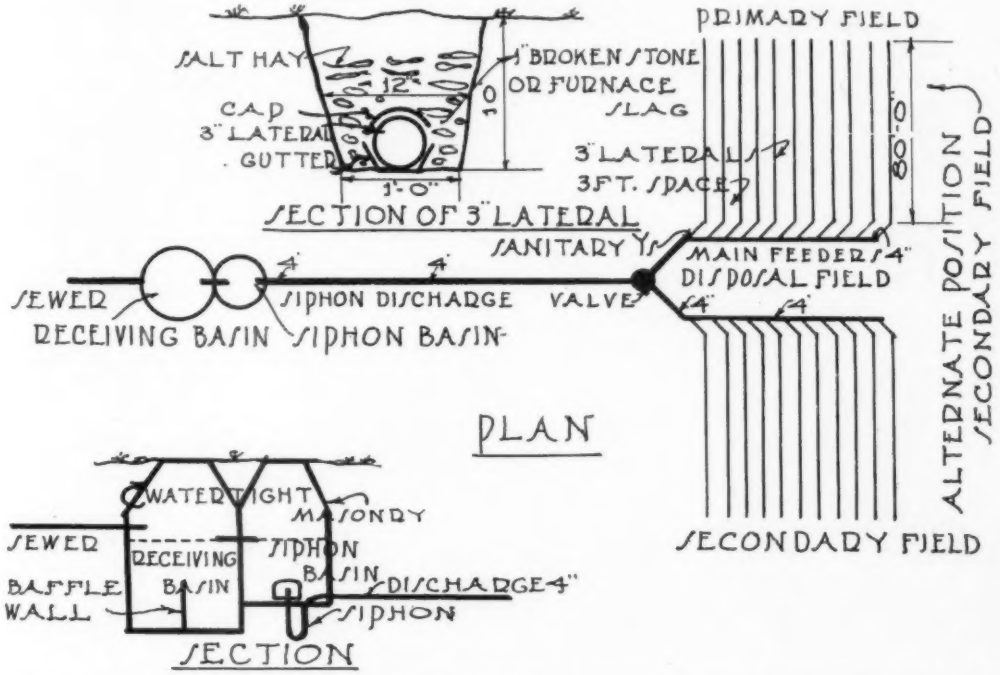


FIG. 1. THE TYPE OF ISOLATED SEWAGE DISPOSAL SYSTEM ABOVE ILLUSTRATED FOLLOWS THE MOST ADVANCED METHODS YET DEVELOPED

which settle to the bottom in the form of a thick black viscous sludge into which bacterial activity continues, as well as the formation of gases which escape to the outer air. The resulting effluent should be free of suspended matter, and is generally of grayish color, with slight sweetish odor, and retains much heat.

The receiving basin must be of the correct size. This cannot be determined until the daily water consumption within the house is known. The depth of sewage should, if possible, not be over 4 ft. 6 in., which has been generally accepted as correct from numerous scientific experiments. The receiv- ous interference with the proper action of the filtering media. The road material carried by the drainage from wash tables quickly settles in the sewers, causing interruption of flow and final stoppage.

The location and character of the surrounding material, for final disposition, for whatever mode may be employed, is most important and cannot be selected with indifference. The location should be upon gradual, sloping, unshaded ground exposed to the sun and at considerable distance from growing shrubbery or trees whose root tendrils may seek the nitrogen in the effluent, enter the sewer pipe and interfere with the free absorption by the earth.

The surrounding material must be of gravel or sand; loam and hardpan should be avoided as much as possible on account of their non-absorbent qualities. When this is impracticable the means of disposal must be considerably increased or the unit subdivided. An area of generous proportions is necessary for final disposal, situated at some rather remote and protected point and should not be used for general farming purposes, nor traversed by the farm implements. It should be placed at as great a distance from the source of the water supply as is practical to avoid contamination.

The scientific method of sewage disposal is most elementary and mechanical in its application, and consists of consigning the effluent to the earth in such quantities and manner that it may be readily and continuously absorbed. This may be accomplished in a number of ways which differ radically from each other in form and cost, but the underlying principle is the same.

The most advanced method of sewage disposal

FIG. 2. THE STEPPED UP ARRANGEMENT OF THE MAIN FEEDERS HERE SHOWN IS NECESSARY WHEN THESE ARE LAID ON STEEPLY SLOPING GROUND

and one of highest scientific attainment is shown in Fig. 1. A chamber is provided containing a siphon which acts automatically when the sewage has reached a predetermined height and discharges the entire contents at point of disposal in one operation. The siphon is manufactured in one piece, is most simple in construction, has no moving parts and can be readily installed. From the siphon chamber the effluent is discharged into disposal fields, primary and secondary, one of which is always in use, generally for a period of two weeks, while the other is at rest, recuperating, as demanded by good practice. The valve shown on the siphon discharge directs the flow to either field as desired.

These disposal fields consist of lateral lines of drainage tile laid a short distance below the surface of the ground. The laterals, a cross section of which is shown in Fig. 1, consist of 3-inch tile laid with open joints, protected against falling material by caps, laid 10 to 12 inches below the surface of the ground and surrounded on top and sides with a 4-inch layer of 1-inch broken stone or furnace slag which is protected by a thick layer of salt hay against the filling entering the interstices. These lines are taken from 4-inch sanitary right and left Y's with 3-inch branches, are spaced 3 to 4 feet apart, as shown in Fig. 1, are laid very flat, with a fall of but 6 inches in their entire length, and are approximately 80 feet long. This length has been scientifically determined as correct, so that each siphon discharge completely fills all lines, allowing the contents slowly to seep into the surrounding media through the open joints.

It often develops that a hillside is the only available space upon which to locate the disposal field, which necessitates special forms for the main feeders, so that the onrush at each siphon discharge may not burst through to the surface at the end, and not completely fill each lateral. To obviate this and reduce the velocity of flow to a normal rate, the main feeders are installed in a series of steps, as shown in Fig. 2, with the horizontal space between each step laid flat, so that the rate of flow is greatly reduced.

The country estate of the late Captain De Lamar at Glen Cove, L. I., is here shown and the sewage disposal system installed is clearly indicated. This estate was fully illustrated in our issue of September 17, 1919

A New Development in Liquid Fuel

There has appeared on the fuel market a new source of energy—that is, a new combination of old sources in the form of a colloidal suspension of coal particles in fuel oil. This furnishes a readier and cheaper fuel and makes possible the use of the poorer coal veins for the coal content. It can be sealed against combustion, has a greater heat content per unit weight than either coal or oil, handles as simply and easily, is self-quenching in water, burns without ash, yet is capable of throwing up the densest of smoke screens by the proper manipulation of the air registers on the furnaces. This feature is of use in naval warfare.

It was developed by the Submarine Defense Association, a private concern, with the assistance of the United States Navy and the British Admiralty to combat the scarcity of fuel during the war.

Many failures had come from attempts of a similar nature for the same reason that lemon seeds fall to the bottom of a glass of lemonade—gravity. But Linden W. Bates by first pulverizing the coal to nearly molecular fineness and perfecting a suspending ingredient—a fixateur—was able to overcome gravity and keep the coal in suspension in a sort of colloidal form. It was tested just before the signing of the armistice and is now ready for commercial use. The fuel will flow in pipes under pressure and will atomize readily in old equipment.

Foundations, Their Selection, Design and Construction

Preliminary Investigation of Subsoil Necessary for Intelligent Design

PRACTICALLY every architect realizes the importance of foundations, therefore it would seem unnecessary to stress this phase of the subject, but there are so many factors necessary to the proper selection and design of a foundation that although the seriousness of the problem may be realized, yet for some unexplained reason the careful and necessary preliminary work demanded to arrive at the right solution is often neglected. In this article I will attempt to point out the reasons for and methods of such preliminary work in subsoil investigation.

It has frequently been stated in advocacy of the "cost plus" method of letting contracts (the merits or defects of which will not be entered into here) that one of the major advantages of this plan is the speed of construction possible under its provisions, and in support of this contention it is stated in all seriousness that the foundations may be completed while the plans for the rest of the building are being worked out. A more fallacious claim was never made, for the plans of the entire structure must be well developed before the foundations can be even properly designed, let alone constructed. Some preliminary work such as the excavation is, of course, possible and often desirable.

Not only must the plans be well developed, so that a fairly approximate estimate of the loads to be supported may be made, but a knowledge of the nature of the material on which such foundations will rest is absolutely essential before intelligent work on the design can be commenced.

Three general conditions of a building site exist prior to the commencement of the work: (1) The site may be wholly or partially occupied by existing structures; (2) It may consist of vacant prop-

TESTING THE SOIL

The subsoil on which the above test was conducted consisted of fine, dry, compact sand slightly mixed with loam. The Building Department would have allowed 3 tons per sq. ft. After a successful test for 6 tons, during which a 50 per cent overload was placed, this higher loading was allowed, permitting a substantial saving in cost of foundations. The leg of the platform extends 16 ft. below the curb level

erty at or above the curb level; or (3) It may consist of vacant property the surface of which is at approximately the basement level of the proposed structure.

In either case it is necessary to determine the nature of the subsoil at the assumed foundation level—usually a few feet below the basement floor.

When conditions are as described in Case 1, the basement or cellar level of the existing buildings is often at approximately the level of that of the proposed structure. In this case it is only necessary to open up several pits 3 ft. to 4 ft. square, and carried to the proposed level of the new foundations in order to determine the nature of the soil at such level. In sections where the subsoil is known to be uniform, one such pit will be adequate. However, in many localities the nature of the subsoil varies to such an extent that it would not be safe to depend on one such opening. For buildings up to 100 ft. square, a test pit near each of the four corners and one in the center will prove sufficient, unless the soil excavated from these locations varies radically, in which case a closer analysis will be necessary.

When conditions are as described in Case 2, it is frequently possible to determine the nature of the soil without great difficulty. In such cases rock will often be encountered, cropping out on the surface, and a little investigation should determine whether it is safe to assume that the entire foundations will rest on rock. When, however, rock crops out at one corner of the lot, and dips down sharply, the strata making an angle of 60 degrees or less with the vertical, it is likely that rock in the other portions of the lot will be encountered only at great depth. In such a case a foundation resting partially on rock and partially on soil may necessarily be selected. This is one of the most difficult of foundations to design. If, however, the top soil consists of filled-in ground, or is of such nature that no close approximation of the underlying strata can be made, test pits should be dug as already described, or if the foundations are to be at any great depth, it will be better to have borings made. When conditions are as described for Case 3, the opening of several test pits will usually be sufficient.

By following the foregoing suggestions, the nature of the soil at the assumed foundation level will be made evident. This, however, may not end the preliminary investigation.

Suppose the proposed structure is to be 16 stories, with column spacing of 20 ft. in each direction, to be occupied as a factory with a live load of 200 lbs. per sq. ft. The dead load will be assumed at 75 lbs. per sq. ft. Then the load brought to the column footing will be:

Roof—40 lbs. dead+60 lbs. live=100 lbs. per sq. ft.
16 floors at 75 lbs. dead+200 lbs. live each=16x 275 or 4,400 lbs. per sq. ft.

The total loading for roof and 16 floors will be 4,500 lbs. Since each column supports 20′x20′ or 400 sq. ft. of floor area the load on the footing will be 400x4,500=1,800,000 lbs. or 900 tons.

TABLE 1. SAFE LOAD ON FOUNDATION SOIL IN TONS PER SQ. FT.

NATURE OF SOIL	NEW YORK	PHILADELPHIA	DETROIT	DENVER	SAN FRANCISCO	MERRIMAN'S HANDBOOK	FAIR AVERAGE VALUE
SOFT CLAY OR SOFT WET SAND	1			1	1	1 to 2	1 to 1½
SAND & CLAY MIXED	2		2	2	2		2
FIRM CLAY	2			2	3	4-6	2-3
LOAM OR FINE DRY SAND	3		3	3	3		3
HARD DRY CLAY	4	3½	4	4	4	6-8	4
COMPACT SAND	4	3½	4		4	4-6	4
COARSE GRAVEL	6	6	4		6		6
HARD PAN OR SAND & GRAVEL CEMENTED	10			8		8-10	8 to 10
SOFT ROCK	8					5-10	8
SHALE ROCK				8			8
MEDIUM ROCK	15					15-20	15
HARD ROCK	40				20	25-200	30 UPWARD

WHEN NO SOIL BEARING VALUE IS SPECIFIED BY THE LOCAL BUILDING DEPARTMENT AND NO SOIL TEST IS HELD, THE FIGURES GIVEN IN THE RIGHT HAND COLUMN WILL GIVE SATISFACTORY RESULTS

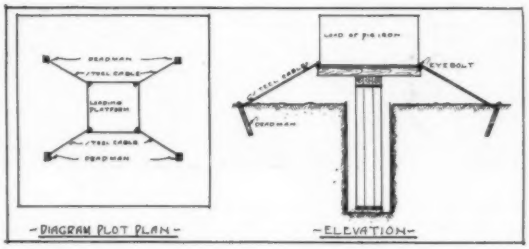


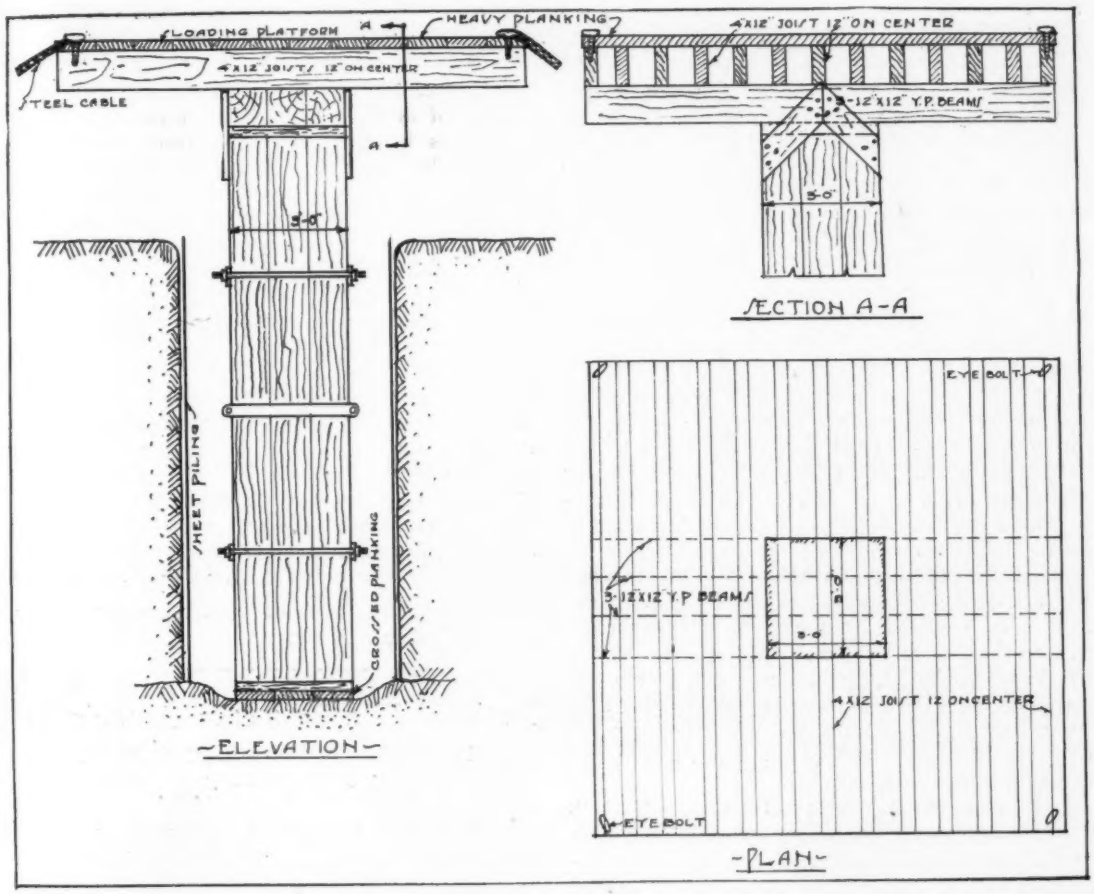
DIAGRAM SHOWING METHOD OF BRACING SOIL TESTING PLATFORM WITH STEEL CABLES OR WIRE GUYS TO PREVENT TILTING

Assume that upon investigation of the soil, this is found to be sand and clay mixed, on which according to the regulations of the local building bureau an allowable loading of 2 tons per sq. ft. is permitted. If spread footings at this level were used, each column footing would have to have an area of spread of four hundred and fifty square feet, since

$\frac{900}{2}$ =450 sq. ft. This is plainly impossible, since the entire area available per column is only 400 sq. ft. (cols. being spaced 20 ft. centers). Plainly spread footing would be out of the question on a two-ton loading.

Some other type must be chosen or an actual test on the soil made to determine if a higher bearing value is safe. To indicate the value of a preliminary investigation, let us suppose that in this instance none had been made, and because of data obtained from the excavation made for a building a hundred feet distant, compact sand was pre-supposed, on which a safe loading would be 4 tons per sq. ft. On this basis spread footings have been designed, contracts let, and work commenced. When the excavation reaches the footing level no compact sand is encountered. The building inspector will not permit the work to proceed, and the entire foundation must be redesigned with all the attendant delay and contract difficulties.

A good compact stratum will often be encountered underlying a soft top soil. When soil of small bearing value is found at or a little below the basement level, it will usually pay to dig deeper. The nature of the soil at a lower level may be determined by open test pits or by borings. The latter are not used to as great an extent as they should be. Such borings can often be made by an ordinary wood auger. Wash borings are probably the most common type employed, are not expensive and can be made rapidly. By careful inspection of the material brought up, the depth at which firmer soil exists can be judged quite accurately by a person experienced in such work.



TESTING PLATFORMS CONSTRUCTED AS SHOWN BY THE ABOVE DRAWING HAVE GIVEN SATISFACTORY SERVICE WHEN SECURELY BRACED AS SHOWN IN THE DIAGRAM ON THE OPPOSITE PAGE

This information will show whether it is best to use spread footings at the basement level; to go deeper with open excavation; to adopt a pile foundation or to use pneumatic caissons.

In Table 1 the safe loads on different foundation soils as permitted by various building codes and other authorities are given. These figures have been arrived at through experience, and are conservative. For instance, on compact sand, if dry and confined, a loading of 8 tons could often be safely allowed. By inspection it is not possible to determine whether such a value would be safe and so a lesser value is fixed to cover average conditions. This applies in a more or less degree to other soils. The only method of determining the maximum safe bearing value is by actual test. Practically every building code, besides specifying allowable loads on soils, contains some clause such as the following:

"The Building Department shall have the power to demand that tests be made of the bearing capacity of the soil whenever the department may deem it advisable. All such required tests shall be made under the direction of and to the entire satisfaction of the department and at the owner's expense."

The New York City code also contains this provision preceding the table of allowable safe loads:

"In the absence of a satisfactory test of the sustaining power of the soil, different soils, excluding mud, shall be deemed to safely sustain the following loads. . . ."

In many instances, an actual test on the soil will reveal that it is capable of sustaining a greater load than specified by the local building code. Where there is any doubt, therefore, such a test should be conducted, and its cost will, in the majority of cases, be more than compensated for by the reduction in cost of the foundations. Having conducted a large number of such tests, I feel justified in making this statement.

In an effort to economize in the cost of the test, an area of only one square foot was frequently suggested and sometimes used. A fair test is impossible on such a limited area, and the results cannot be taken as applying to large areas. The minimum that should be used is 2 ft. x 2 ft. and better results are obtained by loading an area 3 ft. x 3 ft. As difficulty has been encountered in some instances when conducting these tests, due to improper construction of the test structure, a sketch showing a satisfactory type of structure is here given. Most of the trouble occurred by the test platform assuming a lopsided position during loading, and frequently breaking away from the bracing and toppling over before the test was completed. This tendency is more prevalent when the area loaded is small.

It is important that the loading material be evenly applied to the platform to reduce this tendency. Pig iron is the material most frequently used in such tests. Cast iron elevator weights have also been used, but these require the use of a derrick for placement. When the load is not great a box for sand will be found satisfactory. Bricks are also sometimes used. In one test a large rivetted steel tank was up ended on the loading platform and filled with water. This tank had to be exceedingly well braced, and while it proved satisfactory in this instance, I would not recommend the general adoption of this plan. Pig iron has proved the most satisfactory loading material.

Before conducting the soil test, the desired loading is fixed by the architect. The soil should then be first loaded to this amount, readings being taken as the loading progresses to note the settlement. This load should be left in place for 24 hours and a reading taken at the end of this period, after which a 50 per cent excess loading should be placed, and the settlement noted during its application. The total load should be kept in place for six days and readings taken daily. If the settlement is progressive, the desired loading should not be permitted. If, however, it slackens daily and reduces to practically zero after the third or fourth day, the proposed loading is safe. The maximum settlement during the entire test should not exceed 2 in. In many cases (on compact sand or gravel) it has not exceeded ½ inch.

The next article will deal with the selection of the most suitable type of foundation for several sets of given conditions.

National Fire Protection Association to Hold Annual Meeting at Chicago May 4, 5, 6

In connection with the annual meeting of the National Fire Protection Association, it is urged that all those who contemplate attending this meeting make hotel reservations at once due to the congested conditions of the Chicago hotels.

Some of the features on the program include a visit to Underwriters' Laboratories on the afternoon of the second day, May 5; a noon luncheon for May 5 planned by the Chicago Chapter N. F. P. A.; an outline of the fire prevention work of the Fire Prevention Bureau of the Pacific by Jay W. Stevens of San Francisco, Manager of the Bureau. The new three-reel fire prevention motion picture, "America's Greatest Crime," will be shown at the meeting.

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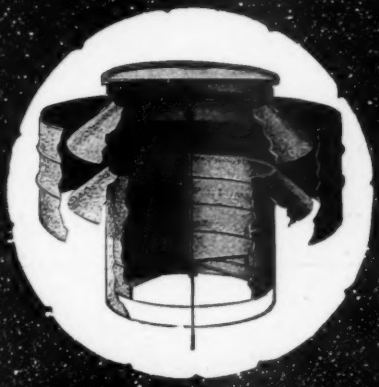

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There are two styles of Burt Ventilators—glass top and metal top. The glass top type serves as both ventilator and skylight. Both styles have the patented sliding cone damper operated from below by a cord and pulley.

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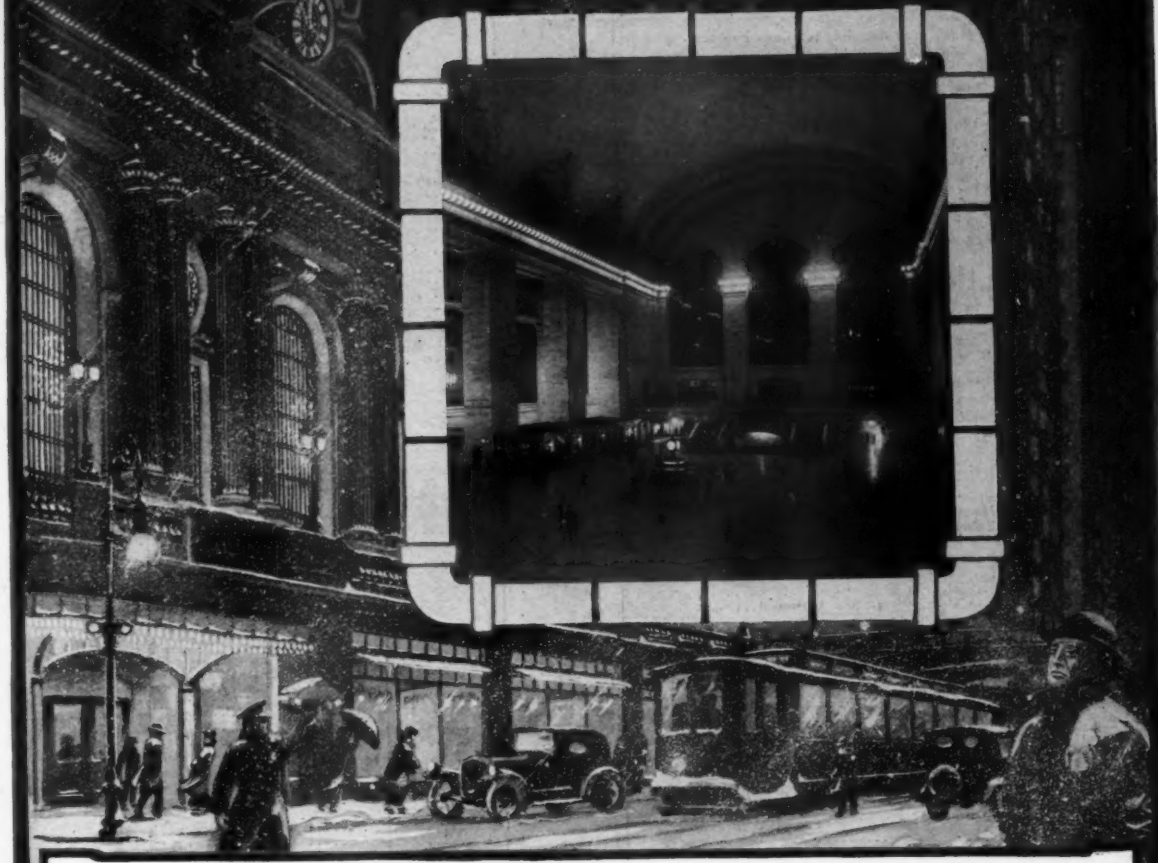
Late Quotations in Building Material Markets

(Price quotations now current on building materials and supplies as quoted by dealers and jobbers for delivery in New York, Chicago, San Francisco, Seattle, and Birmingham follow. The quotations set forth are placed before readers of THE AMERICAN ARCHITECT to afford an accurate review of market conditions, rather than for use as a basis for actual purchase. They will not only provide knowledge of the exact state of the market as to items quoted, but will also present a basis to judge conditions as affecting correlating materials.)

	New York	Chicago	San Francisco	Seattle	Birmingham
BRICK					
Common	$30.45	$14.00	$18.00	$20.00	$28.00
Face brick	55.00 to 60.00	30.00 to 40.00	60.00 to 62.50	65.00	45.00
BURNED CLAY (Delivered on Job)					
Block partition:					
3 in., per sq. ft.	0.13	0.10	.....	0.10½	.....
4 in., per sq. ft.	0.15	0.11	.....	0.10	.....
Wall coping (single slant):					
8 in., per lin. ft.	0.16	0.22	.....	.....	0.22
12 in., per ft.	0.26½	0.33	.....	.....	0.32
18 in., per ft.	0.54	0.66	.....	.....	0.52
(Corners and angles four times the price of one foot of coping the same size)					
CEMENT					
Per bbl. in 15-cent bags (rebate 60 cents per bbl. for bags)	3.80	3.25	4.00	....	4.50
FINISHED IRON AND STEEL (Mill Shipments)					
Bar iron, refined grade	.....	.....	.....	6.00	.....
Bar iron, double refined	.....	.....	.....	.....	.....
Soft steel bars	2.62 to 4.52	.....	.....	6.00	4.00
Shapes	2.72 to 4.27	.....	.....	6.00	.....
GLASS (Discounts from Manufacturer's Price Lists)					
Single strength, A quality, first three brackets	75%	77%	.....	.....	.....
Single strength, B quality	75%	77%	.....	83%	.....
Double strength, A quality	77%	79%	.....	83%	.....
Double strength, B quality	79%	79%	.....	.....	.....
GYPSUM					
Plaster board:					
27x28x1	.....	.....	.....	.....	.....
27x48x ½	0.45	.....	.....	.....	.....
32x36x ¼	0.28	0.24	.....	.....	0.40
32x36x ⅜	0.29	0.26	.....	0.36	.....
32x36x ½	0.35	.....	.....	.....	.....
Plaster blocks:					
2 in. solid, 12x30, per sq. ft.	0.13	0.12	.....	.....	.....
3 in. hollow, 12x30, per sq. ft.	0.13	0.12	.....	.....	.....
4 in. hollow, 12x30, per sq. ft.	0.14	0.13½	.....	.....	.....
6 in. hollow, 12x30, per sq. ft.	0.21¼	0.20	.....	.....	.....
HOLLOW TILE					
2x 8x12 partitions, per 1,000 sq. ft.	.....	.....	80.00	.....	.....
3x12x12 partitions, per 1,000 sq. ft.	.....	110.00	108.00	105.00	112.00
4x12x12 partitions, per 1,000 sq. ft.	.....	118.00	125.00	120.00	126.00
6x12x12 partitions, per 1,000 sq. ft.	.....	162.20	154.50	170.00	168.00
8x12x12 partitions, per 1,000 sq. ft.	.....	221.10	222.50	230.00	224.00
10x12x12 partitions, per 1,000 sq. ft.	.....	272.70	276.00	.....	.....
12x12x12 partitions, per 1,000 sq. ft.	.....	316.90	.....	.....	.....
2x12x12 split furring, per 1,000 sq. ft.	.....	73.80	108.00	.....	.....
LATH					
Eastern spruce, per thousand	18.00 to 20.00	17.00 to 18.00	18.00	....	.....
No. 1 white pine, per thousand	15.00 to 18.00	....	21.00	.....	.....
No. 1 hemlock, per thousand	15.00 to 18.00	17.00 to 18.00	18.00	12.50	.....
No. 1 yellow pine, per thousand	15.00 to 18.00	16.00 to 18.00	18.00	.....	20.00
LIME					
Common, 200 lb. bbls., per bbl.	3.80	1.75	2.75	2.85	2.50
Finishing, 300 lb. bbls., per bbl.	19.50	.....	.....	3.00	2.50
Hydrated, in paper bags, per ton	.....	20.00	.....	25.00	2.50
LUMBER (Retail Prices per Thousand Delivered)					
Yellow pine, No. 1 boards, 1x6	80.00	95.00	.....	.....	125.00
Yellow pine, B, and better flooring (plain)	130.00	135.00	.....	.....	135.00
Douglas fir, 6x6 to 12x12	80.00	77.00	50 to 60	34.00 to 36.50	.....
Oak, quartered, 1 in., F. A. S.	325.00	370.00	500.00	.....	.....
Oak, plain, 1 in., F. A. S.	225.00	260.00	320.00	.....	200.70
Oak flooring, ¼ quartered, white	220.00	370.00	470.00	.....	.....
Maple, 1 in., F. A. S.	180.00	185.00	270.00	.....	.....
Maple flooring, ¼ clear	175.00	370.00	225.00	.....	.....
Mahogany, 1 in., F. A. S.	.....	225.00	500.00	.....	.....
Spruce, 10 in.	85.00	80 to 140	104.00	.....	.....
Cypress, 1 in., F. A. S.	150.00	150.00	.....	.....	.....
METAL LATH					
Under 100 sq. yd., per sq. yd.	0.40	.35	.....	0.42	0.42

"85% Magnesia" -Saves coal- adds heat



HEATING the Grand Central Terminal is a "neighborhood" operation, because not only the terminal itself but several of the largest adjacent hotels and other important buildings, are heated from the Grand Central plant.

Several hundred *carloads* of "85% Magnesia" Pipe and Boiler Covering were used to cover the hundreds of miles of underground steam mains; but in all the years since its installation, there has *never been a failure* to deliver ample warmth to *every* part of *every* building.

Without this efficient protection for pipes and boilers, such an operation would be impossible, but by thus conserving heat and saving coal these "85% Magnesia" coverings pay their own cost every few months.

What "85% Magnesia" Pipe and Boiler Covering does for this vast Grand Central heating plant, it is doing in countless other large buildings. Also in *power plants* and *central stations* where the highest pressures and superheat demand the supreme type of heat-insulation, "85% Magnesia" Pipe and Boiler Covering is attested by the most eminent engineers, as unrivalled for economy, efficiency and durability.

The Rest of the Story

Send for the new treatise "Defend Your Steam" which describes the triumphs, fields and uses of "85% Magnesia" Pipe and Boiler Covering.

Also for the new and revised Specification for the application of "85% Magnesia" coverings to all heated surfaces—compiled by the Mellon Institute of Industrial Research, Pittsburgh University.

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Late Quotations in Building Material Markets—*Continued*

	New York	Chicago	San Francisco	Seattle	Birmingham
PIPE					
Cast iron:					
6 in. and heavier	$67.30	$72.80	.....	$92.50	$65.00 to 66.00
4 in.	73.30	75.80	.....	.....	68.00 to 69.00
3 in.	.....	82.80	.....	.....	.....
(And $2 additional for Class A and gas pipe)					
(Discounts to jobbers for carload lots on the Pittsburgh basing card; freight rates from Pittsburgh to New York, and also from Pittsburgh to Chicago, in carloads, per 100 lbs., are 27c. An additional 5 per cent discount is allowed to large jobbing interests over those listed below.)					
	F.O.B. Pittsburgh Butt Weld	F.O.B. Chicago			
Wrought:					
Steel:					
Black, ⅛ to 3 in.	47 to 54 %	38 to 45.1%	.....	34 to 41	.....
Galv., ⅛ to 3 in.	20½ to 41½%	10.1 to 30.1%	.....	31½ to 28	.....
Iron:					
Black, ⅛ to 1½ in.	34½%	11.9 to 22.6%	.....	16½ to 21½	.....
Galv., ⅛ to 1½ in.	+25 to 18½%	+39.9 to 4.6%	.....	3½	.....
	Lap Weld				
Steel:					
Black, 2½ to 6 in.	50 %	41.1%	.....	.....	.....
Galv., 2½ to 6 in.	37½%	27.1%	.....	.....	.....
Iron:					
Black, 2½ to 6 in.	30½%	18 %	.....	.....	.....
Galv., 2½ to 6 in.	17½%	3.6%	.....	.....	.....
PLASTER					
Neat wall cement in 15-cent bags, per ton	23.50	20.00	$18.50 to 20.00	24.50	24.00
Finishing plaster	25.00	20.50	19.50 to 21.00	26.00	24.00
Lath mortar, in cloth bags, per ton	16.50	.....	.....	.....	.....
RADIATION					
Discount from list on standard heights	45%	41 to 42%	.....	41%	44.45%
REINFORCING BARS					
High carbon steel from mill	48.50	.....	47.50	45.00	.....
Medium steel from mill	48.50	.....	55.00	45.00	4.75
ROOFING MATERIAL					
Tarred felt paper:					
No. 1—25 lbs. to 100 sq. ft., per ton	102.00	90.00	.....	120.00	95.00
No. 2—16 lbs. to 100 sq. ft., per ton	81.25	90.00	.....	110.00	95.00
No. 3—12 lbs. to 100 sq. ft., per ton	81.63	90.00	.....	100.00	.....
Rosin sized sheathing, per ton	75.00	.....	.....	110.00	.....
Corrugated roofing, galvanized, 2½ in. corrugation, over flat sheets, per 100 lbs.	0.30	.....	.....	.....	.....
SHINGLES					
Red cedar, 5 to 2, clear, per thousand	15.00	10.00	16.00	6.00	12.00
White cedar, extra star, A star, per thousand	16.00	9.50	17.00	5.75	.....
SLATE ROOFING					
	F.O.B. Cars Quarry Station				
Pennsylvania:					
Best Bangor	$8.00 to $11.00	.....	.....	.....	.....	9.00 to 18.00
No. 1 Bangor Ribbon	8.00 to 9.00	.....	.....	.....	.....	.....
Pen Argyl	7.75 to 8.25	.....	.....	.....	.....	.....
Peach Bottom	10.50 to 12.50	.....	.....	.....	.....	.....
No. 1 Chapman	7.75 to 8.75	.....	.....	.....	.....	.....
Vermont:					
No. 1 Sea Green	5.00 to 8.50	.....	.....	.....	.....	27.00
Unfading Green	6.50 to 13.50	.....	.....	.....	.....	27.00
Red	12.00 to 22.00	.....	.....	.....	.....	30.00
Maine:					
Brownsville, U'f'g Black, No. 1	14.00	.....	.....	.....	.....	.....
Slater's felt, 30 lb. roll	2.00	.....	.....	.....	.....	3.00
Slaters' felt, 40 lb. roll	2.25	.....	.....	.....	.....	3.25
STRUCTURAL STEEL					
Beams and channel, 3 to 15 in., per lb.	3.47	3.47	5.30	4.70 to 5.00	.06 to .0675
Beams and channel, over 15 in., per lb.	3.57	3.57	5.40	.....	.06 to .0685
Angles, 3 to 6 in.	3.47	3.47	.....	4.10	4.70
Zees and tees	3.57	3.47 to 3.52	.....	.....	.....
Steel bars, half extras, from mill	4.00 to 4.75	.....	4.90	4.00	.....
STUCCO					
In cloth, per ton (white, mixed)	22.50	20.50	.....	.....	.....
STUCCO BOARD					
Medium weight stucco board, plain, per thousand sq. ft.	65.00	65.00	.....	.....	65.00
Medium weight stucco board, creosoted, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
Heavy weight stucco board, plain, per thousand sq. ft.	75.00	75.00	.....	.....	75.00
Heavy weight stucco board, creosoted, per thousand sq. ft.	80.00	80.00	.....	.....	80.00
Medium weight stucco board, plain, narrow key, per thousand sq. ft.	75.00	75.00	.....	.....	75.00
Medium weight stucco board, narrow key, creosoted, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
Insulating board, heavy felt background, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
SHEATHING BOARD					
Heavy weight, sheathing board, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
Medium weight sheathing board, per thousand sq. ft.	63.00	63.00	.....	.....	63.00
Stucco or plaster board, sheathing board and insulating board are in rolls containing one sheet 25 ft. long and 4 ft. wide (100 sq. ft.).					
WALL BOARD					
Wall board, shipped any length, 4 ft. wide, per thousand	45.00	50.00	.....	60.00	53.00
Packed flat in cars if ordered in less than car lots. Add $5.00 per thousand ft. for crating.					